IDA PAPER P-2964

ASSESSMENT OF THE CONTRACTOR COST DATA REPORTING (CCDR) SYSTEM

Stephen J. Balut
John J. Cloos

September 1994

Prepared for
Office of the Director (Program Analysis and Evaluation)

INSTITUTE FOR DEFENSE ANALYSES
1801 N. Beauregard Street, Alexandria, Virginia 22311-1772

IDA Log No. HQ 94-45274

DEFINITIONS

IDA publishes the following documents to report the results of its work.

Reports

Reports are the most authoritative and most carefully considered products IDA publishes. They normally embody results of major projects which (a) have a direct bearing on decisions affecting major programs, (b) address issues of significant concern to the Executive Branch, the Congress and/or the public, or (c) address issues that have significant economic implications. IDA Reports are reviewed by outside panels of experts to ensure their high quality and relevance to the problems studied, and they are released by the President of IDA.

Group Reports

Group Reports record the findings and results of IDA established working groups and panels composed of senior individuals addressing major issues which otherwise would be the subject of an IDA Report. IDA Group Reports are reviewed by the senior individuals responsible for the project and others as selected by IDA to ensure their high quality and relevance to the problems studied, and are released by the President of IDA.

Papers

Papers, also authoritative and carefully considered products of IDA, address studies that are narrower in scope than those covered in Reports. IDA Papers are reviewed to ensure that they meet the high standards expected of refereed papers in professional journals or formal Agency reports.

Documents

IDA Documents are used for the convenience of the sponsors or the analysts (a) to record substantive work done in quick reaction studies, (b) to record the proceedings of conferences and meetings, (c) to make available preliminary and tentative results of analyses, (d) to record data developed in the course of an investigation, or (e) to forward information that is essentially unanalyzed and unevaluated. The review of IDA Documents is suited to their content and intended use.

The work reported in this document was conducted under contract MDA 903 89 C 0003 for the Department of Defense. The publication of this IDA document does not indicate endorsement by the Department of Defense, nor should the contents be construed as reflecting the official position of that Agency.

IDA PAPER P-2964

ASSESSMENT OF THE CONTRACTOR COST DATA REPORTING (CCDR) SYSTEM

Stephen J. Balut
John J. Cloos

September 1994

INSTITUTE FOR DEFENSE ANALYSES
Contract MDA 903 89 C 0003
Task T-Q7-855

PREFACE

This paper was prepared by the Institute for Defense Analyses (IDA) for the Office of the Director (Program Analysis and Evaluation) under a task entitled "Assessment of CCDR System." It makes recommendations for improving the quality and usefulness of data being purchased by the DoD under the Contractor Cost Data Reporting (CCDR) system.

We would like to express our appreciation to all the personnel from the 23 government and contractor organizations who participated fully in the study. We want to acknowledge their cooperation, candor, and clear desire to improve the CCDR system.

This work was reviewed by Thomas P. Frazier, Matthew S. Goldberg, Stanley A. Horowitz, Daniel B. Levine, William J. E. Shafer, and Robert H. Simmons, all of IDA, and by Howard Manetti, an IDA consultant.

CONTENTS

FIGURES

TABLES

EXECUTIVE SUMMARY

The Contractor Cost Data Reporting (CCDR) system is one of several cost data collection systems that were established to meet the rising demand for cost information that was fueled by the introduction and application of economic principles into defense management and resource allocation processes during the 1950s, 1960s, and 1970s. The need for records of actual cost experiences on major systems is driven by the requirements to use such data when developing cost estimates for proposed weapon systems approaching acquisition milestones and to prepare Cost and Operational Effectiveness Analyses (COEAs) at these milestones.

This study was initiated following criticism encountered during two separate studies. First, government and contractor comments provided to the Joint DoD/Industry Total Quality Management Team in 1991 showed considerable dissatisfaction with the quality, usefulness, and use of the CCDR data. Secondly, the DoD Inspector General found that the CCDR system was not providing the benefits originally intended. Defense cost analysts were intended to use CCDR data to prepare cost estimates for major system acquisitions reviewed by the Defense Acquisition Board, to develop independent government cost estimates in support of cost and price analyses and contract negotiations, and to track contractors' negotiated costs. The objective of this study was to recommend ways to improve the quality and usefulness of the cost data acquired by the CCDR system. Our findings are based mainly on facts and opinions provided by eleven DoD cost analysis offices, five program management offices, and seven defense contractors.

This information revealed regulatory weaknesses at the DoD level and implementation failures at all levels. Participating offices reported that CCDR data are not being used to the extent originally intended. The predominant reasons given include the existence of disincentives for collection and use, lack of confidence by defense cost analysts that the data are accurate, unavailability or inaccessibility of data when needed, and lack of understanding of the data and its uses. These problems stem mainly from DoD's failure to commit adequate resources to accomplish education and validation, storage, distribution, and processing of data.

We concluded that because defense cost analysts must base projections of future costs on actual cost experiences ("actuals"), they will get actuals one way or another, with

or without a systematic collection system such as the CCDR. Non-standard, ad hoc collection would cost more and be less effective than the current systematic, managed collection. Further, the quality of data collected by the CCDR system has suffered from lack of attention and needs improvement. Finally, the usefulness of CCDR data has been impaired by lack of systematic validation and difficulty in gaining access to reports.

Although impediments to usage of CCDR data are significant, they are by no means insurmountable. Implementation of our recommendations will rebuild confidence, provide ready access, and increase utility and knowledge of and experience with these data.

The following actions will improve the quality of CCDR data:

- *Revise and update data planning and collection instructions.* We recommend that a tri-Service team be established and charged with responsibility for updating CCDR reporting requirements and identifying changes needed to the 5000 series of DoD instructions that result from this update.
- *Ensure thorough coverage.* We recommend that mechanisms be established to ensure that reporting is initiated on all programs and contracts that fall within the dollar threshold guidelines of the CCDR system and that requirements in approved plans are placed on contract.
- *Conduct audits.* We recommend that on-site reviews of contractors' capabilities to produce the specific data elements placed on contract be conducted at the start of new contracts and periodically thereafter.
- *Validate data upon receipt from contractors.* We recommend that requirements and procedures for timely validation of CCDR data upon receipt from contractors be established and implemented.
- *Monitor the system.* We recommend that implementation of the CCDR system be aggressively and consistently monitored.

The following actions will increase the usefulness of CCDR data:

- *Strengthen incentives and facilitate use.* We recommend that program offices be encouraged to collect cost information at levels of detail below work breakdown structure (WBS) level 3, when such detail is needed to support both program/contract management activities and the broader cost analysis function of the DoD. Further, we recommend that DoD offices with legitimate needs for CCDR data be readily provided that data. For example, DoD offices should not be required to go through the contractor that provided the CCDR reports or the Service that purchased the data.
- *Establish a central clearinghouse for cost information.* We recommend a central clearinghouse for defense cost information be established under the sponsorship of and funded by the Under Secretary of Defense (Acquisition and

Technology), with responsibility, staffing, and supervision by the Chairman, OSD Cost Analysis Improvement Group (CAIG).

- *Target data collection to future needs.* We recommend that future data needs of the defense cost analysis community as a whole be systematically determined and used to target data collection on individual programs and contracts.
- *Emphasize application in cost research.* We recommend that future updates to the DoD Six-Year Cost Research Plan emphasize the application of CCDR data to the development of estimating relationships.
- *Improve knowledge and understanding.* We recommend that Defense Acquisition University (DAU) develop course materials and member universities offer courses, course segments, or short courses on the nature and uses of cost information available within the DoD. We also recommend that periodic government/industry conferences be conducted on the need for and uses of contractor cost information. Further, we recommend training materials be developed and distributed to cost analysis and program management offices for the purpose of training staff members on the nature and uses of cost information available within the DoD.

We believe the costs to accomplish these improvements are small compared to the benefits to be gained. Increased applications of contractor cost data, as intended, will provide for more informed decisions in defense acquisition and resource management processes. Potential return on investment is high.

I. INTRODUCTION

The Contractor Cost Data Reporting (CCDR) system, as it exists today, is the product of over fifty years of events and decisions within the defense community that have affected the quality and utility of the data it contains. In this chapter, we describe the circumstances that gave rise to the demand for cost information as reported in the CCDR, and explain how this form of cost reporting evolved. We then report the motivation for this study, the study objectives, and the approach. Finally, we outline the remainder of the report.

A. BACKGROUND[1]

The demand for cost information increased as a result of a confluence of circumstances and changes in the defense community that took place after World War II. These are explained briefly in the following chronology.

The forerunners of the RAND Corporation, the Institute for Defense Analyses (IDA), and the Center for Naval Analyses (CNA) were formed during and shortly after World War II. Civilian scientists at these organizations applied newly developed operations research methods to problems involving the allocation of defense resources. Operations research sought to "use scientific methods to get the most out of available resources" [1].

Also after the war, the separation of military responsibilities (between the Services) broke down as a consequence of the rapid development of military technology and the different character of the military threat [2]. Battles over missions were settled via approval of budgets for new weapon systems. Economic principles were introduced into defense decision making with the development and application of cost-effectiveness analyses to aid weapon selection decisions.

The use of cost-effectiveness analyses to support resource allocation decisions increased with the introduction in 1961 of the Planning, Programming, and Budgeting System (PPBS) and economic principles to the defense resource allocation process [3]. New weapon systems were considered on the basis of cost-effectiveness. When equally

---

[1] Ms. Geri Asher, OD(PA&E), was a key source of information used to construct this historical view of defense cost data collection systems.

effective weapon systems were compared, those estimated to cost the least won funding approvals.

The speedy introduction of the cost-effectiveness approach left the Services ill-prepared to present and defend their programs to the OSD. The Services lost programs (e.g., Skybolt, B-70, Nike, and escort ships), had others (e.g., M-16, F-4) forced upon them [4], and consequently took steps to improve their cost-estimating capabilities. To support such improvement, the collection of cost data was expanded and accelerated.

Thus, as the demand for cost estimates increased in the 1950s and early 1960s, so did the demand for records of past cost experiences. The DoD tried to meet this demand by maintaining internal records of budgets and expenditures and by buying cost information directly from the contractors who develop and produce defense systems. The practice of buying cost information from contractors started during World War II with the initiation of the Aeronautical Manufacturers' Planning Report (AMPR) and two similar reports that addressed missile systems (MMPR) and missile support equipment (MSEMPR) [5].

In 1963, the AMPR and related reports were replaced by a standardized reporting system called the Defense Contractors' Planning Report (DCPR) [5]. A cross-Service DCPR Implementation Task Group existed for one year to ensure uniform report implementation, data processing, and report submission. The following year, Assistant Secretary of Defense (Comptroller) Charles J. Hitch established the Cost and Economic Information System (CEIS) with issuance of DoD Directive (DoDD) 7041.1 [6]. The objectives of this system were to:

- provide the ability to make justifiable choices among alternative program decisions,
- permit the negotiation of sound system contracts,
- allow closer control of development and production costs, and
- facilitate evaluation of the economic impact of procurement decisions.

Two data sets were envisioned by this initiative, one containing cost information, the other economic information. The cost part of the CEIS, called the Cost Information Report (CIR), was implemented in 1966 with issuance of DoD Instruction (DoDI) 7041.2 [7] and the related pamphlet "Cost Information Reports (CIR) for Aircraft, Missile and Space Systems" [8]. This instruction required cost data collection via the CIR and phased out the DCPR. The CIR applied to major systems that met certain dollar thresholds. The practice of preparing program- and contract-specific data plans was initiated with the CIR.

The related Economic Information System (EIS), implemented separately from the CIR, became a joint NASA-DoD system for a time, and has since taken other forms.

President Lyndon B. Johnson expanded the PPBS and the cost-effectiveness approach to resource allocation to all federal agencies in 1965, but by that time the public had become increasingly aware of the costs and cost growth associated with weapon systems. High-ranking military officers began speaking out in public against the cost-effectiveness approach [4], and in 1968 Secretary of Defense James R. Schlessinger warned the Congress of the limitations of economic analysis in national security issues [9]. Shortly afterwards, Secretary of Defense Melvin Laird de-emphasized the role of cost-effectiveness and returned decision-making authority to the Services.

By 1969, substantial cost growth had occurred in 27 of 35 major systems [4]. The Congress became less tolerant of cost overruns and demanded more credible cost estimates. One initiative during this period went beyond the cost reports being provided by contractors: it dealt with the management and control systems contractors use to prepare the reports. In 1967, Cost/Schedule Control Systems Criteria (C/SCSC) were established [10] to encourage defense contractors to install management control systems that would provide sound bases for decision making by both the DoD and contractors. Initiation of the C/SCSC was the result of the decline of a technique referred to as PERT Cost during this period [11].[2]

Meanwhile, Military Standard 881, Work Breakdown Structure (WBS), was issued in 1968 to ensure costs would be collected in a form that would support PERT Cost, CIR, and other initiatives. The WBS has been fundamental to cost estimating and cost data collection ever since. A brief description of the WBS concept is provided here to support subsequent discussions of the nature of the data collected under the CCDR system.

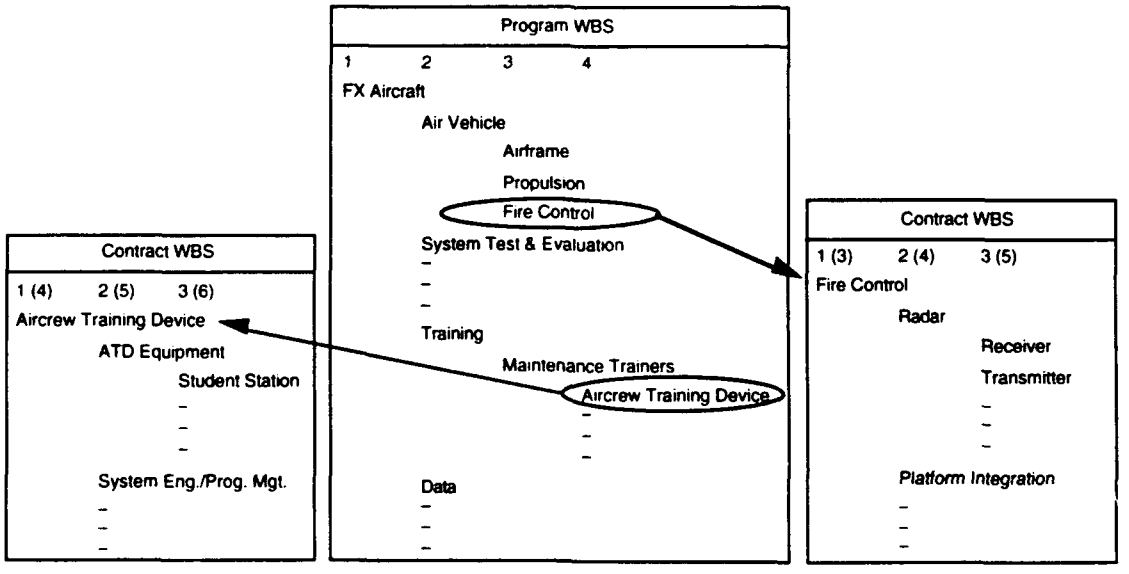
The basic concept of a WBS is to break a product down into parts to facilitate management, reporting, and cost estimating. The WBS serves as the basis for communication throughout the acquisition process. It establishes the common link to unify the planning, scheduling, cost estimating, budgeting, contracting, configuration management, and performance management [12]. In a WBS, a product is represented as a hierarchical tree composed of hardware, software, facilities, data, services, and other work

---

2 Program Evaluation and Review Technique (PERT) is a dynamic project management tool that uses statistical probability concepts to plan and estimate the time required to complete all project activities. PERT Cost extends PERT by incorporating economic considerations in the form of cost factors for the various network activities. A cost estimate prepared for each activity can be used to evaluate alternatives for accomplishing the activities based on allocation of resources.

tasks. This tree completely defines the product and the work to be accomplished to achieve the product. It relates the elements of work to each other and to the end product. Reference [12], which contains generic WBSs by commodity type, is used by the Military Departments as a starting point for developing a specific Program WBS for a new system. A Program WBS covers the acquisition of a specific defense material item and is related to contractual effort. In the case of a tactical aircraft, this includes not only the air vehicle, but also support equipment, training, site activation, and other support functions.

A program manager (PM) given responsibility for developing, producing, and fielding a new system decides how to acquire each element of the program. Typically, the PM will place certain applicable WBS elements on contract. For such items, a Contract WBS is created to extend the Program WBS, starting with the element placed on contract. Figure I-1 portrays the relationship between a Program WBS and Contract WBSs. For illustration (as per Reference [12]), two elements of the Program WBS are extended in this way. A level 3 item in the Program WBS, "Fire Control," and a level 4 item, "Aircrew Training Device," have extended Contract WBSs. Note the difference in the level numbers of identical items in the Program WBS versus the Contract WBS (shown in parentheses in the figure). That is, a level 1 item in a Contract WBS could correspond to a level 4 item in a Program WBS. Contractors are required, by contract, to report costs in CCDR formats using the negotiated Contract WBS. It is worth noting here that cost data collected via a CCDR report represents elements typically at level 3 or below in the Program WBS.



Source: Reference [12]

Figure I-1. Relationship of Program WBS and Contract WBS

In 1970, the Assistant Secretary (Installations and Logistics) established the Procurement Information Report (PIR) with issuance of DoDI 7000.9 [13] in order to collect data on contracts associated with programs that did not meet CIR dollar threshold requirements. Its purpose was to support the performance of procurement responsibilities. This report established contractor cost data collection on programs and contracts using two formats similar to those prescribed in the CIR.

Resolving to fix the procurement problems experienced in the 1960s, Defense Secretary Laird and Deputy Secretary David Packard undertook a series of actions in the early 1970s [4]. Among them were establishing the Defense Systems Acquisition Review Council (DSARC) and the OSD Cost Analysis Improvement Group (CAIG).

The Contractor Cost Data Reporting (CCDR) system was initiated in 1973 with issuance of DoDI 7000.11 [14]. The CCDR system retained all the CIR reporting requirements, added plant-wide overhead data requirements, and extended coverage to include contracts for programs that fell well below the major acquisition thresholds. It also extended coverage to include selected contracts within major acquisitions not covered by the CIR. The CCDR system superseded the CIR and PIR systems. As with the CIR, the CCDR system was intended "to establish a common database available for use in cost estimating" [14]. Uniform procedures for implementing and administering the CCDR system were published jointly by the Army, Navy, and Air Force in 1973 [15]. Contractor cost data have been collected according to the procedures prescribed in the CIR and CCDR pamphlets for more than 25 years.

Several related contractor cost management reports were initiated in the early 1970s. The Cost Performance Report (CPR), initiated in 1970 with issuance of DODI 7000.8 [16], collected contract cost performance data that provided objective measures of work progress to allow assessment of cost at completion of a contract. The CPR reporting system was consolidated with the Contract Funds Status Report (CFSR) with issuance of DODI 7000.10 [17] in 1973. The CFSR provides contractors' estimates of contract funding requirements. In 1974, DoDI 7000.10 was revised to include a new report called the Cost/Schedule Status Report (C/SSR). The C/SSR, an abbreviated version of the CPR, applies to smaller programs where CPRs are inappropriate. DoDI 7000.10 was superseded by DoD Manual 5000.2, Part 20 [18].

In the early 1980s, Defense Deputy Secretary Frank Carlucci imposed additional demands on the Defense Department's cost analysis capabilities. These changes, collectively referred to as the "Carlucci Initiatives," included the following: requiring the Services to prepare budgets to most likely or expected costs, to budget more realistically for

inflation, and to forecast business base at contractors' plants; allowing use of multi-year procurement based on benefit/risk analysis; requiring economic production rates; providing greater incentives for reaching design-to-cost goals by tying award fees to actual costs in production; and increasing efforts to forecast cost risk and uncertainty.

Assistant Secretary of Defense (Program Analysis and Evaluation) David Chu reinstitutionalized the use of cost-effectiveness analysis by updating defense acquisition management policies and procedures in the early 1990s. Over the last several years, various directives and instructions that address the CCDR, CPR, C/SSR, and CFSR were canceled and superseded by an update to DoDD 5000.1, "Defense Acquisition" [19], and related instructions (e.g., DoDI 5000.2 [20] and DoD Manual 5000.2 [18], referred to as DoD 5000.2-M). Cost and Operational Effectiveness Analyses (COEAs) are now required at major milestones [6]. Part 20 of Reference [18] prescribes standard cost reports, including CCDR, CPR, C/SSR and CFSR.

Today, the Defense Department's cost-estimating capabilities are again being called into question. First, in "Joint DoD/Industry Total Quality Management Team Report for Program Management on the Cost/Schedule Management Process" [21], the team found considerable dissatisfaction with the CCDR system in the DoD and defense industry. DoD participants in the study expressed reservations about the quality, usefulness, and use of the data, while industry questioned whether DoD was actually using the data. Second, in his report "Independent Cost Estimating for Major Defense Acquistion Programs" [22], DoD Inspector General Derek J. Vander Schaaf raised questions about the DoD's cost research program, the adequacy of efforts to develop methods and techniques to project costs, and the level of effort directed towards identifying and resolving impediments to improving the cost analysis process. A number of comments were critical of the management of the CCDR system at both the OSD and Service levels.[3] In his response, Assistant Secretary of Defense (Program Analysis and Evaluation) Chu, acknowledged weaknesses and requested funds for a DoD-wide CCDR database and a re-examination of the CCDR [22]. This study was initiated in response to both of the efforts described above.

B. OBJECTIVE

The objective of this study was to recommend ways to improve the quality and usefulness of data being purchased by the DoD under the CCDR system.

---

[3] For example, the Inspector General specifically noted that the Services were not submitting the required annual CCDR Status Reports, a practice that limited the ability of the CAIG to assess action needed to correct data deficiencies.

The term "quality" refers to the accuracy, consistency, and accessibility of the data made available to cost analysts. These characteristics vary as a result of the data requirements and formats, data reporting, data validation, data storage, and data distribution involved in the organization and operation of the CCDR system. The term "usefulness" refers to the utility of the output of the data collection and distribution system, particularly for intended purposes.

Although considered separately here, quality and usefulness are interrelated characteristics that affect one another. That is, usefulness of the data to cost analysts increases with quality. Conversely, quality improves as cost analysts increase usage and produce/demand better data.

C. APPROACH

Although the study sponsor, the Chairman of the OSD CAIG, establishes policy for the CCDR system, DoD-wide, he is primarily responsible for oversight of Acquisition Category I (ACAT I) programs.[4] The full CCDR system of reports (i.e., four formats), applicable to all contract types, including firm-fixed-price, are submitted periodically over the life of ACAT I programs. On the other hand, responsibility for oversight and implementation on ACAT II, III, and IV programs rests with the Military Departments. These programs usually employ only two CCDR formats and generally are not required on firm-fixed-price contracts. Reports are usually submitted only at contract completion. For these reasons, the study focused on the CCDR system as applied to ACAT I programs.

Conduct of the study involved four activities:

- *Review procedures.* We reviewed all known DoD regulations and instructions in force that apply to the CCDR system. This review resulted in a description of how the CCDR data collection and distribution system is supposed to be operating, along with a clear delineation of responsibilities. We also identified uses of CCDR data that are required by directive.

---

4 All acquisition programs, except highly sensitive classified programs, are placed in one of four acquisition categories (ACAT I, II, III, and IV) beginning at Milestone I. This categorization is based on specific designations by OSD and component acquisition officials and component heads or based on estimated program costs. An ACAT I classification results from one of two circumstances. First, the Under Secretary of Defense (Acquisition) can specifically designate a program as ACAT I. Secondly, programs are classified as ACAT I if costs are estimated by the Under Secretary to be more than $200 million in FY 1980 constant dollars ($300 million in FY 1990 constant dollars) for research, development, test, and evaluation, or more than $1 billion in FY 1980 constant dollars ($1.8 billion in FY 1990 constant dollars) for procurement. See Reference [6] for detailed criteria for all ACAT classifications.

- *Determine status.* We determined the status of the system, that is, how the data collection and distribution system is actually operating, in two ways. First, we surveyed representative samplings from both government and contractor organizations that participate in the CCDR system. Information was obtained via informal meetings and discussions, and results were documented in written summaries (included in Appendix A). Each summary was reviewed by the cognizant official of the organization surveyed. A composite of these individual summaries, which together characterize the participants' assessment of the CCDR system, is presented in Appendix B. Second, we obtained written status reports from the Military Departments that address the Service data collection and distribution systems from a Service-wide perspective. This information was used to describe how the system is currently operating and to compare current operations to intended operations.
- *Assess usage.* Our assessment was based on the extent to which the data resulting from operation of the CCDR data collection and distribution system were being used as intended. We researched the uses of these data in two ways. Information gathered during our survey of government and contractor participants included reports of uses of the data. We also searched the open literature for reports on applications of the data. The information we found was used to assess the system by comparing observed uses to the purposes established for the system. These comparisons brought to light strengths and weaknesses of the system.
- *Provide recommendations.* The results of the assessment provided a basis for identifying possible improvements in the organization, administration, and operation of the CCDR data collection and distribution system that would ultimately result in improvement in the quality and usefulness of data acquired.

Following up on the previous Total Quality Management (TQM) study, representatives of the National Security Industrial Association (NSIA) voluntarily provided their views of the CCDR system and recommendations for improvement. NSIA's submission is included as Appendix C. This organization represents a broad spectrum of defense contractors—many more than we were able to survey.

This study also benefited from the parallel activities of a joint OSD/Service Working Group. Through conduct of a Baseline Activity (AS-IS) Workshop, the group modeled current CCDR business practices, identified potential improvement opportunities, and recommended specific business process improvements. The report of this group [23] was considered during this study.

D. ORGANIZATION OF THIS REPORT

This paper reflects the results of our review of the CCDR system and includes specific recommendations for improving the system. Chapter II describes the current purposes, organization and responsibilities, and reports and reporting requirements of the CCDR system as specified in DoD regulations and instructions. This framework establishes the basis for comparisons made throughout the study. Chapter III describes our observations on the extent to which the CCDR system is organized and operating as intended. Chapter IV presents our findings as to the extent that cost analysts are using CCDR data for intended purposes. Finally, Chapter V offers recommendations that will improve the quality and usefulness of the CCDR data.

II. CURRENT PROCEDURES

In this chapter, we describe the purposes, organization and responsibilities, and reports and reporting requirements of the CCDR system as specified in DoD regulations and instructions now in effect. We also briefly describe other contractor cost data collection systems to identify possibly unnecessary redundancies. This view of current procedures served as the basis for comparisons made throughout the remainder of the report.

A. REGULATORY BASIS

The revision of the Cost Information Reporting system in 1973 resulted in the issuance of DoDI 7000.11, "Contractor Cost Data Reporting" [14]. The updated CIR pamphlet with uniform procedures for contractor cost reporting was published jointly by the Army, Navy, and Air Force. This new pamphlet was titled "Contractor Cost Data Reporting (CCDR) System" [15]. The procedures prescribed in the CCDR pamphlet remain in effect today. In 1991, DoDI 7000.11 was replaced with issuance of DoD 5000.2-M, "Defense Acquisition Management Documentation and Reports" [18]. Part 20 of this manual assigns responsibilities for the CCDR and other cost reports. Required uses of data resulting from operation of the CCDR system are contained in DoD 5000.4-M, "Cost Analysis Guidance and Procedures" [24].

B. PURPOSES

The CCDR system was intended to be the primary database for most DoD cost-estimating efforts [15]. The CCDR system is supposed to be used by all DoD Components to:

- *Prepare cost estimates for major system acquisitions reviewed by the Defense Acquisition Board (DAB).* The database is intended primarily to support development of parametric estimating models for use in deriving independent cost estimates.
- *Develop independent government cost estimates in support of cost and price analyses and contract negotiations.* The CCDR database provides a direct contractor input with major contract pricing proposals.
- *Track contractors' negotiated costs.*

The first purpose listed refers mainly to the activities of cost analysis organizations that prepare cost estimates for major weapon systems that ultimately are presented to the DAB at system milestone reviews (milestones are described in Reference [20]). These estimates include Program Office Estimates (POEs) prepared by or for system program managers in the Military Departments, Component Cost Analyses (CCAs) prepared by Service organizations other than the program offices (usually Service cost centers/agencies), and independent cost estimates prepared mainly by the OSD CAIG [20].

The nature of these estimates differ substantially depending on the point in time the estimate is made, where time is measured in terms of the life of the acquisition program. Early in a program's life (Milestone 0, Concept Exploration and Definition, and perhaps Milestone I, Demonstration and Validation), a weapon system is usually described broadly in terms of its performance characteristics (e.g., range, speed, payload, etc.). At such times, few technical details are firmly established. At this point cost estimates are usually derived at the weapon system flyaway/rollaway level[1] using methods that use performance characteristics as independent variables. The first purpose of the CCDR system is to support the development of methods for use in developing such estimates early in a system's life [15]. Such general cost methods could be used to estimate the 10th, 30th, and/or 100th unit production cost of an aircraft, and the results could be used to position a unit cost-progress curve in log-log space. The cost-progress curve would then be used to derive estimates for a variety of production quantities, schedules and rates of production.

The second purpose of the CCDR system addresses the need for cost estimates during contracting, particularly for the engineering and manufacturing development (EMD) and production phases of an acquisition. During contracting, more is known about the physical and technical characteristics of the system. Armed with more detailed descriptions of the system and its component parts, cost analysts rely on cost-estimating relationships (CERs), methods that relate physical and technical characteristics to cost as well as engineering build-up methods. In developing such estimates, weapon systems are described in terms of Program and contract WBSs. Separate estimates are usually prepared for individual WBS elements, some of which correspond to separate contracts and others to line items in contracts. Estimates of the costs of these elements are intended to aid in contract negotiations. These component estimates are then combined with other data to

---

[1] Flyaway includes three of the level 2 Military Standard 881B WBS elements (prime mission equipment, system engineering/project management, and system test and evaluation). The remaining level 2 elements (training, peculiar support equipment, data, operational site activation, initial spares, and facilities) are excluded [24].

arrive at a system-level estimate. A few physical and technical characteristics, such as those needed to develop estimating relationships in preparation for contracting activities (e.g., weight), are collected via the CCDR reporting system.

The third stated purpose of the CCDR system is to assist with tracking contractor cost performance, following negotiations and award of a contract. Contractor performance is a matter of great interest to program managers. Periodic reports provided by the contractor give the program office and other interested parties the opportunity to compare planned expenditures to actual expenditures during the course of the acquisition, and allow timely corrective action, when appropriate.

C. ORGANIZATION AND RESPONSIBILITIES

The CCDR system is a cost data collection and distribution system. Operation of the system as prescribed in regulations *enables* improvement in the cost-estimating capabilities of the DoD. Activities leading to this improvement make use of data made available by the CCDR system and are external to the system itself. In this chapter, we focus mainly on activities up to the point when data have been collected, placed in a repository, and *made available for use* by cost analysts. We also discuss *uses* of the data only to the extent specifically required by existing regulations (i.e., when preparing POEs and CCAs).

The DoD organizations responsible for the operation of the CCDR system are listed in Table II-1. The key organization/officials include the OSD CAIG; Component CCDR Officials, program managers, and cost analysis offices; contractors; and the Defense Contract Audit Agency (DCAA).

The OSD CAIG has overall responsibility for the CCDR system. This office is assigned responsibility for establishing policy guidance [25], implementing policies [18], and monitoring implementation [18 and 25] to ensure consistent and appropriate application throughout the DoD. This office is also responsible for prescribing a format for hard copy and electronic submission of CCDRs [18]; implementing policies, which includes waiving, where appropriate, CCDR reporting requirements on ACAT I programs [18]; reviewing CCDR Plans for ACAT I programs; receiving annual Component-wide CCDR status reports and ad hoc status reports included with POE and CCA presentations; and establishing requirements for field reviews of contractor implementation of the CCDR system [18].

Table II-1. CCDR Organization and Responsibilities

Organization	Responsibilities
OSD	
CAIG	Establish policy [25] Prescribe formats [18] Implement policies [18 and 25] Monitor implementation [25] Review plans [18] Receive status reports [18] Establish requirements for field audits [18]
DCAA	Conduct audits [18 and 26]
Military Departments	
CCDR Official	Establish policies and procedures [18] Designate storage/distribution locations [18] Implement policies [18] Monitor implementation [18] Report status [18] Forward evaluations [18]
Storage Locations	Store data [18] Distribute data [18]
Program Managers	Prepare and submit CCDR Plans [18] Contract [20] Use CCDR data [24] Report status [24]
Cost Analysis Offices	Use CCDR data [24] Report status [24]
Contractors	Provide reports [20]

Note: The numbers in brackets refer to numbers in the list of references (at the back of this report) that correspond to the DoD Directives, Instructions, and Manuals that establish the responsibility.

The DCAA is responsible for conducting audits as requested by higher authority [18 and 26]. Audits consist of evaluations of the effectiveness of contractors' policies and procedures to produce data that meet DoD objectives. Audits are to include selective tests of reported data. Exceptions are to be included in reports submitted to Administrative Contracting Officers, with copies sent to the OSD CAIG and Component CCDR Officials.

According to DoD 5000.2-M [20], each Military Department is required to designate a Component CCDR Official, by title. This official is responsible for establishing Component policies and procedures for implementing the CCDR system, including storage of CCDR data and their distribution to appropriate DoD officials. The CCDR Official is to

designate a Component storage location that is to store and distribute copies of CCDR reports. This official is responsible for implementing the CCDR system, Component-wide; monitoring its implementation; ensuring that all CCDR Plans for ACAT I programs are reviewed and forwarded to the CAIG; and advising the CAIG annually of the status of the CCDR system, Component-wide, identifying delinquencies and deficiencies and actions taken to correct them. When reports are prepared by Components on the accuracy or validity of CCDR data, the Component CCDR Official is to ensure such reports are forwarded to all offices receiving the CCDR reports on which the evaluations were made.

Program managers in the Military Departments are responsible for preparing and submitting CCDR Plans [the CCDR Plan is to be included as Part 12 of the Cost Analysis and Requirements Document (CARD), and the CARD is to be prepared by the program office]. Program managers are to place the data requirements specified in CCDR Plans on contract [20]. When preparing POEs, program managers are to make use of actual cost data as reported in CCDRs to the maximum extent possible, and estimate detail is to be in accordance with CCDR data plans. Further, "Milestone III reviews must be based at least in part on actual production cost data for the systems under review" [24]. When making presentations to the CAIG, program managers are to provide reports of CCDR status. Such reports are to address "the status of the CCDR Plan, or, if implemented, the status of CCDR reporting and processing of the cost data on the defense program being reviewed" [24].

Cost analysis offices of the Military Departments are required to use CCDR data when preparing CCAs and are to report the status of CCDR systems as applied to the subject acquisition programs when making presentations to the CAIG [24]. In such cases, Cost analysis offices are to follow the procedures applicable to program offices as described in the preceding paragraph.

Contractors are required to comply with the terms of their contracts, This includes providing reports [20] on time and in accordance with procedures in Reference [15].

D. REPORTS AND REPORTING REQUIREMENTS

The main components of the CCDR system are the CCDR Plan and the CCDR reports. Examples of each of these formats are shown in Appendix D. The CCDR Plan establishes the contractual data requirements for all contract cost reporting. This includes the four CCDR report formats described below as well as the Cost Performance Report

(CPR), Cost/Schedule Status Report (C/SSR) and the Contract Funds Status Report (CFSR). The plan specifies the type and level of reporting by work breakdown structure (WBS) element, identifies the specific report form to be used, and shows reporting frequency. A CCDR Plan must be submitted to the CAIG for approval prior to letting a contract on all ACAT 1 programs.

The CCDR plans and reporting requirements vary by the acquisition category (ACAT I, II, III, or IV) [20] of the particular system. CCDR plans require CAIG approval for ACAT I programs. ACAT II CCDR Plans require approval of the Program Executive Officer (PEO) or the Systems, Logistics, or Materiel Commander. ACAT I programs use all four CCDR report formats and require reporting on all major firm-fixed-price contracts or subcontracts. ACAT I CCDR reports are provided to the CAIG. ACAT II programs use only the 1921-1 and the 1921-2 report formats and generally are not required on firm-fixed-price contracts. ACAT III and ACAT IV programs may collect CCDR data by following ACAT II procedures at the discretion of the DoD Component head, Acquisition Executive, or designated milestone decision authority. ACAT II reports are not provided to the CAIG unless specifically requested.

The reporting elements of the CCDR system consist of four reports as described in the CCDR pamphlet [15]:

- The *Cost Data Summary Report (DD 1921)* is designed to capture all contract WBS elements at the level specified in the CCDR Plan, to include both a recurring and non-recurring breakout.
- The *Functional Cost-Hour Report (DD 1921-1)* focuses on selected WBS elements where more detailed cost data are needed. The report contains a functional breakout (e.g., engineering, manufacturing). It also contains a cost element breakout (e.g., direct labor, material) within the functional categories.
- The *Progress Curve Report (DD 1921-2)* focuses on the lot or unit data for selected WBS elements. The report captures only recurring costs that are unit-related.
- The *Plant-Wide Data Report (DD 1921-3)* provides a summary of the plant business base. It includes direct costs by program and function, indirect costs by major function, and indirect costs by major (standard) cost categories and functions for the purpose of understanding overhead rates. The 1921, 1921-1, and 1921-2 reports are contract-based while the 1921-3 is plant-based.

Table II-2 summarizes the major contents for each of the reports. The report formats are described in greater detail in Appendix D.

Table II-2. CCDR Content

	Formats			
	1921	1921-1	1921-2	1921-3
All Prescribed WBS Elements	X			
Selected WBS Elements		X	X	
Frequency of Cost Occurrence				
Recurring	X	X	X	
Non-Recurring	X	X		
Functional categories		X	X	X
Cost Elements		X	X	X

E. OTHER COST COLLECTION REPORTS

Streamlining data requirements has long been a stated objective of DoD. Recent cutbacks in defense spending further emphasizes the need to collect only the minimum amount of data to meet mission essential needs. We reviewed other related cost collection systems to assess possible duplication and the potential for reduction or integration of data requirements with the CCDR system.

Various reporting systems are available within DoD that collect contractor data that are similar (or are perceived to be similar) to the data collected by the CCDR system. Figure II-1 summarizes the major DoD program management information systems by the primary purpose of the data: cost estimating (CCDR), contract performance measurement (C/SCSC, CPR, and C/SSR), program status [Selected Acquisition Report (SAR) and Defense Acquisition Executive Summary (DAES)], and contract funds control (CFSR).

We also included forward pricing rate agreements (FPRAs) as a cost collection system, although no external reporting is required. While FPRAs are not part of a reporting system, they are based on supporting cost data routinely obtained from contractors that, at least in part, are similar to CCDR data. Table II-3 summarizes the requirements and application of these systems.

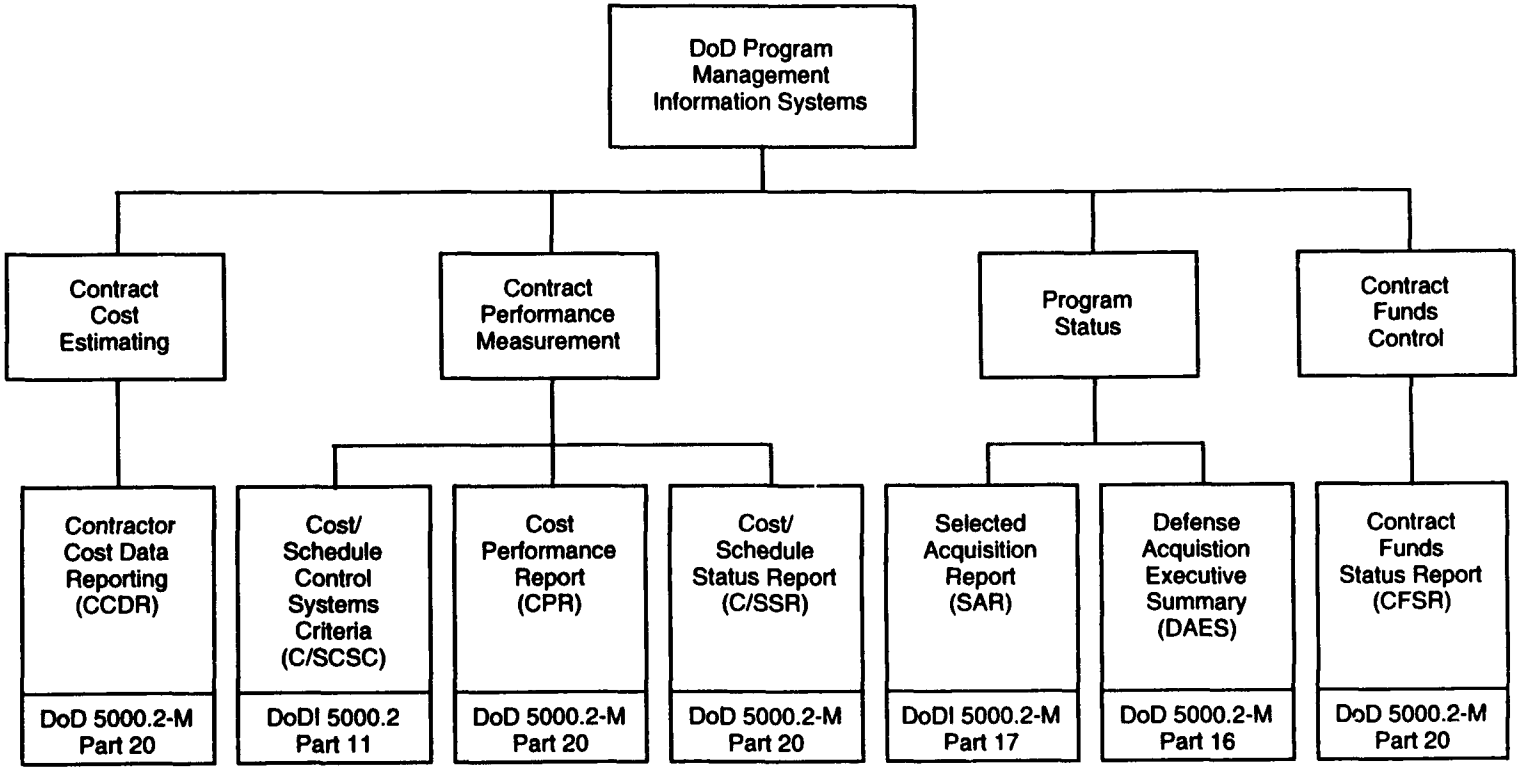


Figure II-1. DoD Program Management Information Systems

Table II-3. Application of Cost Reporting

Report	Cost Focus	Requirement	
		Development	Production
Contractor Reports			
CPR	Contract (prime and major subcontractors)	C/SCSC compliance (a contract of $60 million[a] or more)	C/SCSC compliance and a contract of $250 million[a] or more
C/SSR	Contract	No CPR and a contract of $5 million[a] or more	Same as development
CFSR	Contract	Generally a contract of $1 million[a] or more	Same as development
FPRA	Plant-Wide	High contract pricing volume	Same as development
CCDR (ACAT I)	Contract (prime and major subcontractors)	ACAT I Programs	Same as development
DoD Reports			
SAR	Program (with some contract)	ACAT I Contracts	Same as development
DAES	Program (with some contract)	ACAT I Programs	Same as development

[a] FY 1990 constant dollars. Generally does not apply to firm fixed price contracts.

The following subsections briefly describe the other cost collection systems. Appendix E contains more detailed descriptions.

1. Cost/Schedule Control Systems Criteria (C/SCSC)

C/SCSC establish standards that the contractor's internal management control system must satisfy to effectively measure, manage, and control contract performance. C/SCSC introduced the concept of "earned value," which measures performance based on budgeted cost of work performed compared to actual contractor costs incurred. Although C/SCSC do not require any reports per se, contractors may be required to submit standard DoD reports using their validated C/SCSC system.

The standard report typically required on major systems for all contract types except firm-fixed-price is the Cost Performance Report (CPR) [27]. For smaller contracts and those that are not subject to C/SCSC compliance, the more condensed Cost/Schedule Status Report (C/SSR) [28] is used in place of the CPR. The last of three standard reports is the Contract Funds Status Report (CFSR) [29], which satisfies budget requirements.

a. Cost Performance Report (CPR)

The CPR is generally required on major contracts that require C/SCSC compliance. The CPR is used to collect cost and schedule information on a specific contract to assist in

program management by providing early warning of difficulties that affect cost and schedule. The report focuses on comparing budgeted cost and schedule data against actual costs to date by contract WBS. These data, along with the computed cost and schedule variances, can be used to focus management attention and to project estimated costs at contract completion. The CPR consists of five major formats. We were interested in Formats 1 and 2 because they relate to the 1921 and 1921-1 reports, respectively. Format 1 is the CPR-WBS Report and Format 2 is the CPR-Functional Categories Report.

The CPR has one general shortfall compared to the CCDR in that it is not normally required on firm-fixed-price contracts. Also, the CPR does not include data similar to that collected for the 1921-2 or the 1921-3 reports. Formats 1 and 2 do not provide all the necessary data available in the CCDR formats. Specifically, Format 1 of the CPR does not provide a recurring and non-recurring breakout of costs like the 1921 report does. Format 2 provides a contractor-unique functional structure for total contractor costs and not by specific WBS as the 1921-1 does with a common (across all contracts) functional structure.

b. Cost/Schedule Status Report (C/SSR)

The C/SSR summarizes cost and schedule performance data on contracts where CPR application is not appropriate. The C/SSR has only one format and the data reported are similar to Format 1 of the CPR. The primary difference is that cost and variance data are shown for the cumulative period only.

Like the CPR, the C/SSR is not normally required on firm-fixed-price contracts and does not provide the recurring and non-recurring split by WBS. The C/SSR does not provide any data comparable to the 1921-1, -2, and -3 reports.

c. Contract Funds Status Report (CFSR)

The CFSR is designed to provide funding data on individual contracts to help in budgeting and managing for contract funding. The CFSR consists of two major sections. The first section captures actual and predicted funding information, and the second section focuses on actual and projected work authorized.

The CFSR is primarily a planning, budgeting, and execution document. The report is not used in estimating costs per se but can be used with other contractor cost projections (e.g., CCDR, CPR, and C/SSR) to help in determining the cost breakout by fiscal year for budget purposes. As in the case of the CPR and the C/SSR, the CFSR is generally not required on firm-fixed-price contracts.

2. Forward Pricing Rate Agreements (FPRA)

An FPRA is a written agreement between the government and the contractor to use certain rates and factors during a specific period to price contracts and contract modifications. FPRAs generally apply to the current fiscal year and two succeeding fiscal years, although the length may vary based on the contractor's individual circumstances. Overhead rates are typically an integral part of FPRAs.

FPRAs are useful to contract price analysts and cost analysts for a particular contract. However, the cost data are presented in the contractor's unique structure. There is no requirement to establish a common structure (as in the 1921-3), which would help in analysis across contracts and contractors. Like the existing 1921-3, the FPRA overhead data are limited by the short future period (current plus three). Cost analysts typically must use alternative sources to project overhead costs in the out-years.

3. Selected Acquisition Report (SAR)

SARs, prepared by DoD Program Managers, provide standard, comprehensive, summary reports on the status of major defense acquisition programs (typically ACAT I). The report summarizes the funding, schedule, and technical status of each major system and the variance analysis from the SAR baseline. In 1975 the SAR became a legal reporting document to the Congress. The SAR contains 19 reporting sections, and all but one (Section 19, Cost/Quantity) are reported to Congress. Section 19 is used for internal DoD purposes.

The SAR is program-oriented rather than contract-oriented as in the CCDR system. While actual costs and variances are included from the CPRs, the dollars reported are for total contract only and do not provide any WBS breakout as does the CCDR system. Also, no functional information (1921-1), detailed progress curve report data (1921-2) or overhead data (1921-3) are provided. The SAR does contain some acquisition, technical, and schedule data that are useful in estimating costs at the total system level.

4. Defense Acquisition Executive Summary (DAES)

The DAES is an internal DoD reporting system designed to provide acquisition managers and executives with early warning of potentially significant program problems to allow for timely resolution. The DAES is a quarterly requirement that applies to all ACAT I programs. The report consists of a cover sheet and eight major sections.

Like the SAR, the DAES contains data useful to cost analysts that are not available in the CCDR. However, the DAES does not provide details for contract costs below the total level, (e.g., WBS elements, functional categories, and cost elements to include an overhead breakout).

F. SUMMARY

From our review of the regulatory basis of the CCDR system, we have seen that the same procedures for implementing the system have been followed since it was initiated in 1973. The data collected is intended to be used by DoD cost analysts primarily to prepare cost estimates for major DAB-reviewed acquisitions, to develop independent government cost estimates, and to track negotiated costs. The key DoD offices/organizations responsible for operating the system share responsibilities ranging from establishing and implementing policy to using, storing, and distributing data. CCDR reporting requirements consist of the Cost Data Summary Report (1921), the Functional Cost-Hour Report (1921-1), the Progress Curve Report (1921-2) , and the Plant-Wide Data Report (1921-3). We have described these reports as well as other reporting systems within DoD that collect data similar to that collected by the CCDR system.

Given this background, we are now ready to determine how well the CCDR system works by looking at the extent to which the intended purposes, responsibilities, and reporting requirements are being carried out.

III. STATUS

In this chapter, we describe the extent to which the CCDR data collection and distribution system is organized and operating as intended, based on our observations during the course of this study. (We discuss the extent to which CCDR data are actually used by cost analysts in the next chapter).

We report here the results of our attempts to answer two questions. First, does the system have a sound regulatory basis? That is, does the organization of the CCDR system, as prescribed in regulations, appropriately define and assign responsibilities? Further, given our understanding of how the system is operating today, does the current organization impede the achievement of the intended purposes of the system? We identified the intended organization via review of applicable instructions and regulations. (The results of this review are summarized in our discussion of Table II-1 in Chapter II.)

Second, is the system organized and operating as prescribed in effective regulations? We determined the existing organization via reports from and discussions with 24 DoD organizations and contractors that are involved in the CCDR process. They are listed here by Component:

- **DoD Organizations**
  - *Army*
    - -- Army Cost and Economic Analysis Center (CEAC)
    - -- Aviation and Troop Command (ATCOM)
    - -- Missile Command (MICOM)
    - -- Space and Strategic Defense Command (SSDC)
    - -- Comanche Program Office
    - -- Hellfire Program Office
  - *Navy*
    - -- Naval Center for Cost Analysis (NCA)
    - -- Naval Air Systems Command (NAVAIR)
    - -- Naval Sea Systems Command (NAVSEA)
    - -- Air-to-Air Program Office
    - -- F/A-18 Program Office

- *Air Force*
  - -- Air Force Cost and Economics Office (SAF/FMC)
  - -- Aeronautical Systems Center (ASC)
  - -- Space and Missile Systems Center (SSMC)
  - -- B-2 Program Office
  - -- F-16 Program Office
- *Defense Agency*
  - -- Ballistic Missile Defense Organization (BMDO)

- **Contractors**
  - General Electric (GE)
  - Lockheed Fort Worth Company (LFWC)
  - Lockheed Aeronautical Systems Company (LASC)
  - McDonnell Douglas Aerospace Company (MDA)
  - Northrop Aircraft Division (NAD)
  - Pratt & Whitney
  - Raytheon Missile Systems Division

For our assessment of survey responses, we grouped the DoD organizations by type rather than component because these groups frequently have different viewpoints. Specifically, we subdivided the DoD cost analysis community into three categories. The first category consisted of the three Service cost centers: CEAC, NCA, and SAF/FMC. For the Air Force, we obtained a consolidated position representing SAF/FMC and the Air Force Cost Analysis Agency (CAA). The second category consisted of cost analysis organizations established within the major Commodity Commands: ATCOM, MICOM, SSDC, NAVAIR, NAVSEA, ASC, SSMC, and BMDO. The third category represented the program offices (POs). POs buy the data but are usually concerned only with their own program. The six POs surveyed were: Comanche, Hellfire, F/A-18 and Air-to-Air Missile, B-2, and F-16. Note that representatives from the F/A-18 and Air-to-Air Missile Program Offices were surveyed together at their request. We therefore treated their responses as one (bringing the total number of organizations down to 23). Summaries of the discussions and reports from these organizations are contained in Appendices A and B.

A. ORGANIZATION AND RESPONSIBILITIES

We found that at the DoD level, the regulatory basis of the CCDR system is sound and responsibilities are appropriately placed (with a few exceptions discussed in the following paragraphs). We did not find this to be the case within the Military Departments.

Instructions and regulations at the DoD level (i.e., DoDDs, DoDIs and DCAA Instructions) establish a CCDR system that *could* accomplish its objectives. Responsibilities for policies, procedures, implementation, monitoring, auditing, and reporting are either assigned directly, or the Military Departments are directed to do so (e.g., establish Service policies and procedures; designate a Component CCDR Official; designate a storage and distribution location).

Our review of how the system is actually operating revealed several serious weaknesses in its regulatory structure. The most important weakness is validation of the data submitted in reports provided by contractors.[1] Component cost analysts reported they have not used CCDR data because they had little or no confidence that the data are accurate. A solution to this problem is validation of data upon receipt from contractors and prior to distribution to cost analysis offices. Responsibility for validation is not directly assigned to any office or official in the DoD. It could be argued that current DoD-level regulations intended Component CCDR Officials to include this assignment when establishing Service policies and procedures. In practice, this has not been done by any of the Services.

We found that the Military Departments have not promulgated formal instructions and regulations with the exception of the CCDR pamphlet, promulgated jointly by the Services in 1973 [15]. This pamphlet provides guidance to program managers on preparation of CCDR Plans, and to contractors on preparation of CCDR reports. Certain provisions of this directive, now more than 20 years old, are inconsistent with the provisions of DoD 5000.2-M [18], promulgated in 1991. An example is the assignment of responsibility for issuing instructions for Service implementation of OSD-established policies. DoD 5000.2-M assigns these responsibilities to Component CCDR Officials, while the CCDR pamphlet assigns them to individual commands, some of which no longer exist.

Drawing again on our review of current operations, we found that the data prescribed in the CCDR pamphlet have not served the cost analysis community as well as intended. This situation, discussed later in this chapter can be improved by changing the

---

[1] Validation involves reviewing data to determine that they have been accurately, consistently, and completely reported. *Accuracy* includes agreement with both the contractor's accounting system and other cost reporting systems (e.g., CPR). Accuracy also includes whether the data have been reported in the appropriate cost categories in conformance with the established structure and definitions. *Consistency* refers to the data being reported in the same manner over time. Errors or changes in accounting practices (e.g., changing direct costs to indirect costs) may produce inconsistent data, which then must be adjusted for analytical purposes. *Completeness* means that all data prescribed in the instructions and formats have been provided.

pamphlet to prescribe a data set that will be more useful to cost analysts. We provide recommendations toward this end in Chapter V of this report.

B. OPERATIONS

In some parts of the CCDR system, we found that responsibilities were carried out in a manner that fulfilled both the spirit and intent of existing regulations. In other parts, this was not the case. The following subsections address each of the responsibilities assigned to offices/officials, in the order they are presented in Table II-1.

1. OSD CAIG

OSD CAIG carries the largest burden of responsibility for the CCDR system. These responsibilities are discussed in the following subsections.

a. Establish Policy

We found that policy had been established, at the DoD level, that could have led to accomplishment of the objectives of the CCDR data collection and distribution system provided these policies were aggressively implemented and monitored. In coming to this conclusion, we assumed the Military Departments could have included provisions for validation in Service policies and procedures. Further, we believe the Services would eventually have included validation in their procedures if: (1) these procedures were formally established, and (2) the procedures had been subjected to review by the OSD CAIG.

b. Prescribe Formats

We found that hard copy formats (i.e., 1921,-1,-2,-3) have been prescribed as required. These formats are delineated in reference [15], along with instructions to contractors on how to fill them out. The formats were modified slightly from time to time, the latest occurrence being April, 1989. Electronic formats have also been developed. Descriptions are routinely attached to CCDR Plan approval instructions.

c. Implement Policies

Implementation, at the DoD level, covers the full operation of the CCDR data collection and distribution system. Activities start when a Service initiates planning to acquire a new weapon system, and ends when validated, useful CCDR data are used by defense cost analysts when preparing POE, CCA, and other estimates, and this use is reported. Generally speaking, most activities required to be implemented by the OSD CAIG

have been implemented. However, we found several important features of the intended system that have not been implemented as intended. Exceptions include:

- Component policies and procedures. While policies were promulgated at the DoD level, procedures for implementing these policies in the Military Departments were not, except for the CCDR pamphlet [15], which provides guidance to program managers and contractors.
- Status reporting. In recent years, annual status reporting by the Military Departments had not been routinely required or accomplished. (An annual report was later called for in September 1993. A second annual report was due in February 1994.) Further, we found that CCDR status reports required during POE and CCA presentations to the OSD CAIG were not routinely offered or required.
- Storage locations. Storage locations for CCDR reports were designated in writing by the Military Departments some time in the past in compliance with DoDI 7000.11 (now canceled). The current Army CCDR Official, designated following promulgation of the update to DoD 5000.2-M in 1991, designated the major commodity commands as the Army storage locations. To the best of our knowledge, the other Services have not provided the CAIG with updated designations.
- Use. We found no evidence that the Military Departments had complied with the requirement to make maximum possible use of CCDR data when preparing POEs and CCAs presented to the OSD CAIG at milestone reviews. Further, those we talked to reported that they had not been asked whether they used CCDR data for this purpose.
- Audit. DoD 5000.2-M [18] states: "Requirements for field reviews of contractor implementation of Contractor Cost Data Reporting will be made annually. When needed, an audit report will be requested through the cognizant administrative contracting officer." Because DoD 5000.2-M does not assign responsibility for establishing requirements for field reviews, our interpretation is that the OSD CAIG is either to establish these requirements annually, or direct the Military Departments to do so. We found no evidence that requirements for field reviews were established annually either by the OSD CAIG or by the Military Departments. We acknowledge that the DCAA Contract Audit Manual [26] includes a requirement for annual audits of contractors' capabilities to produce CCDR reports. However, during recent discussions, DCAA officials contended that the provisions of DoD 5000.2-M may have voided the requirement for annual reviews. In any case, we view the directive to be related to but different from that included in the DCAA Contract Audit Manual. We believe the intent of DoD 5000.2-M is that several contractors be selected for field review following an assessment of where such reviews are needed most at that time.

d. Monitor Implementation

We found that the OSD CAIG routinely monitored the operation of a portion of the CCDR system; however, a significant portion was not monitored. A key element that was not monitored was the establishment by the Military Departments of procedures for implementing the CCDR system in the Military Departments. This comment does not apply to the procedures included in the CCDR pamphlet [15] that relate to program managers and contractors. The CAIG was actively involved in and monitored the planning process up to the point when CCDR Plans were approved. In most cases, monitoring broke down after CCDR Plans were approved. Key shortcomings included:

- Component policies and procedures. The operation of the CCDR system within Military Departments, following approval of CCDR Plans, was not monitored by the CAIG. An exception is the systematic logging of reports as received in the office of the OSD CAIG.
- Use. The CAIG did not monitor the use of CCDR data by cost analysis and program management offices when preparing POEs and CCAs. The CAIG also did not enforce the requirement that the status of the CCDR system be reported during presentations to the CAIG.
- Status. The CAIG did not routinely require or receive CCDR status reports (e.g., annual or at CAIG presentations) during the past several years.
- Storage and distribution. The CAIG did not monitor the CCDR storage and distribution functions assigned to the Military Departments. Further, we found no evidence that the CAIG facilitated access to and exchange of CCDR reports between data owners and potential data users. (These conditions reportedly resulted from a shortage of assigned resources.)
- Audit. The CAIG did not monitor DCAA's compliance with the requirement to conduct annual audits of contractors' capabilities to prepare CCDR reports.

e. Establish Requirements for Field Audits

As noted in the previous section, this portion of the CCDR system was not implemented within the spirit and intent of DoD 5000.2-M, as we interpret it.

2. Defense Contract Audit Agency

The DCAA's responsibility in the CCDR process is to conduct audits. The DCAA Contract Audit Manual [26] requires DCAA Field Audit Offices (FAOs) to evaluate the effectiveness of the contractor's systems, policies, and procedures for accumulating data and preparing CCDRs at least once each year. Nearly all of the DoD and contractor organizations we visited were unaware of any DCAA audit activity.

As a result, we asked DCAA headquarters if they centrally monitored CCDR audits. They could not provide an overall view for all of DCAA but offered to selectively query their FAOs. We requested the most recent CCDR audit results for the seven contractors who participated in the study. DCAA obtained this information from cognizant FAOs and provided it to us. The results are summarized in Table III-1.

Table III-1. CCDR Audits by DCAA

Contractor	Most Recent Audit	Comments
General Electric	None	—
Lockheed Fort Worth Company	8 May 1993	Requested by DPRO. Limited only to an audit of the reconciliation between the CPR and CCDR.
Lockheed Aerospace Systems Company	18 October 1993	*Self initiated audit. Did not include an* assessment of contractor compliance with the CCDR pamphlet.
McDonnell Douglas Aerospace	23 December 1993	Self-initiated audit. Included an assessment of contractor compliance with the CCDR pamphlet.
Northrop Aircraft Division	None	—
Pratt & Whitney	None	—
Raytheon Missile Systems Division	None	—

DCAA did not identify any audits for four of the seven contractors. The three contractor audits that were reported were limited. Only one FAO used the principal report preparation instructions (the CCDR pamphlet) in their audit. Even in this instance, it was not clear that the auditors reviewed the cost structure for adherence to the definitions contained in the CCDR pamphlet.

3. CCDR Officials

Two Component CCDR Officials have been designated—the Deputy Assistant Secretary of the Army for Cost Analysis (who also serves as the Director of the Army Cost and Economic Analysis Center) and the Technical Director of the Naval Center for Cost Analysis. The Air Force has not designated the position. However, the Chief, Cost Reporting and Analysis Division (SAF/FMCCR) is the Air Force's point of contact on CCDR matters. The positions of the designated individuals within two organizations of the Military Departments gives rise to questions regarding the balance of authority with responsibility. These individuals do not appear to have the authority to execute their responsibilities as described in DoD 5000.2-M. These responsibilities are discussed in the following subsections.

a. Establish Policies and Procedures

In 1973, the Services jointly promulgated the CCDR pamphlet [15]. This was before the Services were required to designate a Component CCDR Official and assign this official responsibilities for establishing Service policies and procedures. The pamphlet, now over 20 years old, directs individual commands (some no longer in existence) to issue internal instructions to perform CCDR functions. We found no evidence of promulgation of formal policies or procedures for implementation of the CCDR system within the Military Departments by the Military Departments.

b. Designate Storage/Distribution Locations

The Army CCDR Official formally designated the commodity commands as its storage and distribution locations. Informally, the Army Cost and Economic Analysis Center also performs this function. The Air Force and Navy have not complied with the full intent of this requirement. Both Services sometimes designated storage locations for specific CCDR reports by entering a location in block 9 of CCDR Plans. However, our spot checks showed that this block was not always completed, and when entries were there, a variety of locations were listed for each Service.

c. Implement Policies

We found that since implementation procedures were not promulgated within the Military Departments, implementation was ad hoc, spotty, and inconsistent. We found that CCDR Plans were developed, reviewed, and included in contracts. Reports were received from contractors. After that point, the system broke down. Generally speaking, data were not validated or stored in a central location, provisions were not made for distribution to other government offices, data were not used in preparation of POEs and CCAs, status reports were not made, and audits were not monitored.

d. Monitor Implementation

We found that the CCDR system was not monitored, Component-wide, in any of the Military Departments as of the time of this study. The portion of the system dealing with plans was closely watched by all concerned. However, the rest of the system was not monitored from a Service perspective.

e. Report Status

We found that CCDR Status Reports—including annual reports required of CCDR Officials and the reports required to accompany POEs and CCAs provided to the CAIG at milestone reviews—had not been routinely submitted up to the time of this study.

f. Forward Evaluations

We found no evidence that assessments of CCDR data were forwarded to those who received the reports.

4. Storage Locations

Storage locations are responsible both for storage and distribution of CCDR data.

a. Store Data

The Army Cost and Economic Analysis Center, informally functioning as the Army's storage and distribution location, developed an automated system for storing Army CCDR data. Army CCDR data are being entered into this automated system. Coverage does not yet include all contracts on which the Army has included CCDR requirements. The Air Force and Navy have not designated Component-wide storage and distribution locations as of this writing. As a result, Air Force and Navy CCDR data are not stored in a central location.

b. Distribute Data

The Army Cost and Economic Analysis Center makes data that are entered onto its automated system available to other government offices in electronic format. The other Services have not made provisions for distribution of Component-wide CCDR data.

5. Program Managers

Program managers are responsible for preparing and submitting CCDR Plans, overseeing the contract, using CCDR data to prepare POEs, and reporting on the status of the CCDR system.

a. Prepare and Submit CCDR Plans

During our sampling of program offices, we found that CCDR Plans were prepared, as required, by these offices. However, we received evidence from a cost analysis office at a Commodity Command that Plans were not prepared on all systems

meeting the criteria for reporting as specified in DoD 5000.2-M. A weakness in this process, according to cost analysts, was the lack of participation by cost analysis offices in the development of CCDR Plans.

b. Contract

We found that, generally speaking, program offices fulfilled their contracting responsibilities with regard to CCDR reports. However, we were told that program managers occasionally "negotiated away" selected provisions in approved CCDR Plans without the interested cost analysis offices being aware this had occurred until long after the contract was executed.

c. Use CCDR Data

We found that program offices did not use CCDR data when preparing POEs. The reason given in all cases was that better, more timely data were available directly from the contractors' accounting systems. This matter is discussed further in Chapter IV of this report.

d. Report Status

Program offices reported they have not included CCDR status reports in briefings to the OSD CAIG at milestone reviews.

6. Cost Analysis Offices

Cost analysis offices are also tasked with using CCDR data when preparing CCA estimates and reporting on the status of the CCDR system.

a. Use CCDR Data

The representatives of the sample of cost analysis offices participating in our study reported little to no use of CCDR data when developing CCA estimates.

b. Report Status

Cost analysis offices in our sample told us they did not include a report of the status of the CCDR system in their CCA presentations at milestone reviews.

7. Contractors

Contractors are, of course, responsible for providing CCDR cost reports. We found the sample of contractors visited during our study to be serious about preparation

and submission of CCDR reports. Forms 1921 and 1921-1 were usually prepared on the same computer systems that were used to prepared C/SCSC reports, and common elements and totals were compared across reports prior to submission. We found no direct evidence of failure to submit reports as required by contract.

C. SUMMARY

In this chapter, we have tried to determine the extent to which the CCDR data collection and distribution system is organized and operating as intended. We found that, the regulatory basis of the CCDR system is sound at the DoD level and that responsibilities are for the most part appropriately placed. However, we found the opposite to be true at the level of the Military Departments. We also found that CCDR responsibilities are being carried out as intended by existing regulations in some parts of the system and not in other parts. We now move on to an examination of how well the CCDR data are being used as intended.

IV. USES

In this chapter, we report our findings as to the extent to which CCDR data, once they are available to cost analysts, are being used for the purposes originally intended. Generally speaking, we found that data are being used infrequently for some of the intended purposes and not at all for others. Here, we report the areas where usage is low or non-existent, give the reasons why data are not being used, and explain the systemic causes.

This assessment involved gathering information on activities *external* to the CCDR data collection and distribution system. Our primary sources of information were the three Service cost centers/agencies, eight cost analysis organizations at Service Commodity Commands, and five program management offices that participated in our survey. Appendix A contains survey results by individual participants. Appendix B contains a summary and description of all the significant comments and recommendations of all the survey participants by major grouping (cost analysis organizations, program offices, and contractors). Amplifying information was provided by our sponsor, the OSD CAIG. Our secondary sources were catalogs of DoD cost research activities [30 through 34], automated systems maintained by the Services that contain information on defense cost research activities [35], and other open literature sources.

A. USE AS REPORTED BY PARTICIPATING OFFICES

The sampling of organizations that participated in our study represent three different cost analysis perspectives and functions. We separated our discussion of uses into three parts in light of these differences. The program offices are the key implementors of the data collection system. They develop CCDR Plans, place requirements on contract, and collect and distribute the data. They are also responsible for using actual CCDR cost data when preparing Program Office Estimates (POEs). Cost analysis organizations at the Commodity Commands sometimes assist program offices with POEs and also with estimates associated with contracting activities. Service cost centers/agencies do not prepare POEs but rather are responsible for preparation of Component Cost Analyses (CCAs). These offices are also directed to make maximum use of actual cost data when preparing CCAs.

We asked the participating offices to report their uses of CCDR data in two broad categories: (1) when preparing cost estimates and (2) when conducting research to develop estimating relationships. The answers to our questions were to address the offices' activities over the recent past (i.e., the past five years or so). Responses to individual questions were selected from the following scale:

0—CCDR data not used,

1—CCDR data used occasionally but not frequently,

2—CCDR data used moderately, or

3—CCDR data used extensively.

1. Use by Service Cost Centers/Agencies

Table IV-1 summarizes the responses by Service cost centers/agencies. The third column in the table lists the responses provided by SAF/FMC that reflected the combined use by both SAF/FMC and AFCAA. All centers reported using CCDR data infrequently or not at all for the purposes originally established for the CCDR system. All reported infrequent use in preparation of CCAs. The rows in the table corresponding to the Program Office Estimate and Component Cost Position (CCP) contain no responses because the Service cost centers/agencies do not normally develop these estimates. The one exception in the table is the entry for the Air Force. This represents the reported infrequent use by SAF/FMC when preparing CCPs. NCA reported occasional use during the contracting phase, and CEAC reported occasional use for tracking negotiated costs.

Table IV-1. Use by Service Cost Centers/Agencies

	CEAC	NCA	SAF/FMC and AFCAA
Use When Developing Cost Estimates			
For CAIG/DAB reviews			
Program Office Estimate/Baseline	—	—	—
Component Cost Analysis	1	1	1
Component Cost Position	—	—	1
Other	1	1	—
During contracting			
Before receipt of proposal	0	1	0
After receipt of proposal	0	1	0
When tracking negotiated costs	1	0	0
Use When Developing Estimating Relationships			
In-house	1	1	1
By Contractor	3	1	1

The bottom portion of the table displays the reported usage by Service cost centers/ agencies of CCDR data for the purpose of developing estimating relationships. In responding to this set of questions, participants considered forward-looking research activities that resulted in new or improved methods (e.g., cost models, cost-estimating relationships) for the next generation of systems. We asked for separate responses for extent of use by staff members (i.e., "in-house") and extent of use by contractors. The Navy and Air Force Cost Centers reported infrequent use for this purpose, either by their staff or by their contractors. CEAC reported its staff members used CCDR data infrequently to develop estimating relationships, but reported extensive use by CEAC contractors.

2. Use by Service Commodity Commands

Cost analysis organizations at Service Commodity Commands assist program offices with preparation of POEs and also with estimates needed during contracting. In addition, both NAVAIR and NAVSEA assist with preparation of CCPs. In the case of the Army, SSDC rather than CEAC was assigned responsibility for preparing CCAs for selected systems.

Table IV-2 summarizes the responses received from these offices. Two sets of responses were provided by NAVSEA, one for missile systems (the left entries in the NAVSEA column in the table) and the other for ships (the right entries). In the cases of NAVAIR and NAVSEA, separate responses were provided for each of the major milestones (i.e., 0, I, II, and III). The entries in the table for these offices are rounded averages across all milestones. All other offices provided a single response that represented extent of use across all milestones. (Raw, expanded inputs from all offices are contained in Appendix F).

The Commodity Commands reported making greater use of CCDR data than the Service cost centers/agencies. This can be seen by noting that many of the entries in Table IV-2, associated with the Commodity Commands, are greater than 1, while all but one of the entries in Table IV-1, associated with Service cost centers/agencies, are 1 or less. NAVAIR reported the most extensive use across all categories. When assisting with preparation of POEs, MICOM and NAVAIR used CCDR data extensively, while the other offices used it infrequently or not at all. Most offices made some use of CCDR data in support of program office contracting activities. Only the Navy offices reported use for tracking negotiated costs. Most offices preferred to use C/SCSC-related reports for this purpose.

Table IV-2. Use by Service Commodity Command Cost Organizations

	Army			Navy		Air Force		
	ATCOM	MICOM	SSDC	NAVAIR	NAVSEA	ASC	SMC	BMDO
Use When Developing Cost Estimates								
For CAIG/DAB reviews								
Program Office Estimate/Baseline	1	3	—	3	1/0	1	1	—
Component Cost Analysis	—	—	2	—	—	—	—	—
Component Cost Position	—	—	—	3	1/0	—	—	—
Other	—	3	—	—	0/0	1	1	1
During contracting								
Before Proposal	2	0	1	3	1/0	1	0	1
After Proposal	2	0	1	3	0/0	1	0	1
Track negotiated costs	—	0	0	2	1/0	0	0	0
Use When Developing Estimating Relationships								
In-house	1	3	2	3	1/0	1	0	0
By contractors	1	1	1	3	0/0	1	1	1

The bottom portion of Table IV-2 shows that most offices made at least occasional use of CCDR data for the purpose of developing estimating relationships. MICOM and NAVAIR staff members made extensive use of CCDR data for this purpose. All offices except NAVSEA used contractors to perform this function.

3. Use by Program Offices

Table IV-3 displays the reported usage of CCDR data by program offices that participated in our study. These offices plan, contract for, collect, and distribute the data. They are also responsible for preparation of Program Office Estimates (POEs). They do not prepare CCAs or CCPs (and thus the rows in the table associated with these estimates contain no responses). We received a joint response from the NAVAIR cost analysts who were "matrixed" to support both the F/A-18 and the Air-to-Air Missile Program Offices.

Table IV-3. Use by Program Offices

	Comanche	Hellfire	F/A-18 & Air-to-Air	B-2	F-16
Use When Developing Cost Estimates					
For CAIG/DAB reviews					
Program Office Estimate/Baseline	2	2	1	0	0
Component Cost Analysis	—	—	—	—	—
Component Cost Position	—	—	—	—	—
Other	2	2	1	0	0
During contracting					
Before receipt of proposal	2	0	1	0	0
After receipt of proposal	3	0	2	0	0
When tracking negotiated costs	1	0	0	0	0
Use When Developing Estimating Relationships					
In-house	2	2	1	0	0
By Contractor	0	1	0	0	0

Both Air Force program offices (B-2 and F-16) reported not using CCDR data at all. Reports received from their contractors were simply forwarded. The B-2 Program Office reported maintaining a different cost collection system. That system, called Program Cost Report (PCR), gathered more comprehensive and detailed data than the CCDR. The NAVAIR cost analysts supporting the Navy program offices (F/A-18 and Air-to-Air) reported either infrequent or no use of CCDR data for any purpose. Only the Comanche and F/A-18/Air-to-Air Program Offices used CCDR data during contracting. Nearly all of these offices stated preferring to use CPR reports for the purpose of tracking negotiated

costs. The Army program offices (Comanche and Hellfire) reported the greatest use for both developing cost estimates and research into improved estimating relationships.

B. OTHER USES

Catalogs of DoD cost research activities were prepared each of the past five years in conjunction with the annual IDA Cost Research Symposium [30 through 34]. Participants in the symposia were government offices that conduct or sponsor the majority of cost research, DoD-wide, along with Federally Funded Research and Development Centers (FFRDCs) that sponsor cost research independently and also perform research for government offices. Roughly a thousand studies are listed in these catalogs. Out of that total, thirteen studies made use of CCDR data (titles are listed in Appendix G).

The Air Force Cost Analysis Resources Reference System (CARRS) is an electronic database developed by the Air Force Cost Analysis Agency to catalog cost-estimating tools available throughout the DoD. We understand the database was updated in the 1990-1991 time frame. We searched CARRS to identify models and other cost-estimating tools that were developed using CCDR data. Our keyword search resulted in a list of seven databases that were developed using CCDR data. Three of these databases contained CCDR data only, and the remainder contained data from a variety of sources, including CCDR reports. In two cases, statistical analyses accompanied the data. (The titles of these entries in CARRS are listed in Appendix G).

C. REASONS FOR LACK OF USE

In most cases, offices that participated in our study reported infrequent or no use of CCDR data for the purposes originally intended for the system. Representatives of these offices identified reasons for this during our informal interviews. Reasons are presented in considerable detail in the summaries included in Appendix A. We present below a list of consolidated, integrated reasons across all offices. Each individual reason presented below may not apply to all offices, and all reasons may not apply to any one office.

- *Awareness.* Offices were not aware of what data were available at other offices, and there was no convenient place to go to find out.
- *Availability.* Data were not readily available or accessible when needed. There were many reasons given for this. The most frequently cited reasons were: reports were not received; reports were received but not systematically stored in a timely manner; some reports were received but not others; reporting was not contracted for on some programs; and other offices possessing data were unwilling or reluctant to share.

- *Confidence*. Offices were reluctant to use CCDR data, even when readily available, because the quality of the data was suspect. Offices cited experiences in which data were incomplete, inaccurate, inconsistent and irreconcilable with CPR data. Offices reported that despite knowing of inaccuracies and inconsistencies, they did not validate, adjust, or normalize the data. Contractor systems were not always audited, to include tests of data, and results of audits were not distributed to user organizations.
- *Coverage*. Needed data were not collected. Offices cited ACAT I programs without CCDR reporting, contracts (particularly firm-fixed-price) without reporting, and requirements in approved plans that were not included in contracts by program offices.
- *Detail*. Level of reporting detail was not adequate. Offices perceived that OSD's level 3 policy (except for high cost, high risk) was at times too restrictive and not always responsive to the needs of either program offices or cost analysis organizations. Cost analysis organizations felt program offices resisted buying the data they needed.
- *Utility*. The utility of data varied from one format to the next. The 1921 and 1921-1 reports provided the greatest utility and were used the most. The 1921-3 was used the least. Nearly all offices reported not using the 1921-3 at all.
- *Understanding*. Offices cited a lack of understanding, knowledge and experience with CCDR data. The reasons given were the lack of use, lack of opportunities for on-the-job training, and absence of education and training courses on this subject.
- *Resources*. Inadequate resources were allocated to the CCDR system at all levels. Other tasks were given higher priority.

D. IMPEDIMENTS TO USE

The reasons given for not using CCDR data as intended have causes based in the organization and implementation of the CCDR system itself. In the list that follows, we associate reasons with systemic causes, most of which were identified by participating offices. Delineation of these impediments allows subsequent identification of opportunities for improvements to the system that will lead to greater value and use of the data.

- *Awareness*. The following conditions contributed to the lack of awareness by cost analysts as to what data were available:
  - The current system does not provide for a central, DoD-wide clearinghouse that maintains easily accessible records on CCDR reports that have been purchased by the government.

- The current system provides for Service storage and distribution locations. Two out of three Services have not designated centralized Service-wide locations, and none have complete Service-wide records on reports received. Commodity Commands designated as storage locations do not systematically maintain command-wide records of reports received.

- *Availability*. The following are the key system deficiencies that result in data not being available when needed:
  - Reports, once received, are not systematically stored, either centrally within the OSD, Services, or Commodity Commands, or at individual offices.
  - Reports are not always distributed.
  - Offices possessing CCDR reports have been unwilling or reluctant to provide copies to other offices. A typical reply to a request is "you first have to obtain permission from the Service and contractor."

- *Confidence*. The Achilles heel of the CCDR system is the widespread lack of confidence in the data. The following are the key contributors to this condition.
  - The current system does not explicitly provide for validation, although validation is an implied responsibility of program offices. Cost analysts outside the program offices are not generally in a position to identify and correct mistakes in reports due to the relative lack of familiarity with the programs' and contractors' accounting systems.
  - The CCDR system provides disincentives to program offices to expend effort validating CCDR reports. Program offices need cost data in considerable detail, yet during negotiations of CCDR Plans, program offices perceive they are prevented from including the level of detail they need in their plans. This circumstance lowers or eliminates the value of the CCDR to program offices. These offices subsequently ignore the CCDR reports and go directly to the contractors for the data they need. On occasion, program offices create and maintain parallel cost reporting systems that gather CCDR-like data in greater detail. An example is the PCR system currently maintained by the B-2 Program Office. These offices expend a considerable amount of effort validating the data received directly from contractors, because they use it routinely. Starting at the point when CCDR ceases to be of value to the program office, CCDR reports are viewed merely as something received and forwarded to another office.
  - The CCDR system provides for annual audits by DCAA of contractors' capabilities to prepare CCDR reports. However, audits have not been conducted at all locations and with the periodicity required. In addition, we were unable to identify any evidence of tests of data elements

submitted in CCDR reports. When audits were conducted, cost analysis organizations were not advised, and were not on distribution of resulting audit reports. Because of this, cost analysis organizations were unaware of any DCAA involvement with the CCDR system.

- The current system does not provide for on-site reviews of contractors' capabilities to fulfill the reporting requirements placed on contracts at the start of contracts.

- *Coverage*. The following conditions contributed to incomplete coverage of programs and failure to obtain data in approved plans:
  - The current system has no mechanism for ensuring that reporting is initiated on all programs that fall under the purview of the CCDR system.
  - The system allows reporting on certain contracts to be omitted (e.g., firm-fixed-price).
  - The system is not perceived to be flexible enough to adjust to changing circumstances (e.g., contract changes).
  - Cost structures are sometimes decided before cost drivers have been identified.
- *Detail*. The widespread complaints about level of detail were the result of the following condition:
  - The level 3 reporting policy is perceived to be rigidly enforced during negotiations of plans with OSD. Both program offices and cost analysis organizations insist that data are needed, selectively, at lower levels, but do not place them on contract because of OSD objections. These needs are usually related to areas involving new technologies and high cost risk. Program offices reported eventually getting the data they needed directly from the contractors. In this regard, the perceived inflexibility of OSD during negotiations of CCDR Plans has not prevented offices from obtaining needed data. What it has done is lower or eliminate the value of the CCDR to the program office.
- *Utility*. The least useful format was the 1921-3 because it does not provide information that is readily or easily usable by cost analysts. Also, Data on overhead cost drivers are not included in the format and are not routinely available from any source. (This is not the case for program physical, technical, and performance characteristics that are available from a variety of sources). Cost analysts stated a preference for overhead rates negotiated in Forward Pricing Rate Agreements
- *Understanding*. The following conditions contributed to the reported lack of understanding and knowledge of and experience with the CCDR system and the data it collects:

- The system has not been fully implemented or enforced. This has resulted in little or no use of the data as intended. The lack of experience coupled with the lack of understanding results in few, if any, opportunities to conduct on-the-job training for staff members unfamiliar with the system.
- The system does not provide for structured education or training programs on the collection, preparation and use of CCDR data.

- *Resources.* Offices allocated available resources to higher priority tasks for the following reasons:
  - The system has not been fully implemented. Organizations at the Service level and below have neither established policies and procedures (except for the CCDR pamphlet) nor implemented them.
  - Implementation has not been monitored or enforced. OSD has not required full implementation of the system as required by existing directives. The Services have not fully implemented the system, have not monitored the status of the system, and have not taken steps to correct deficiencies.

E. SUMMARY

Our general finding is that data are being used infrequently for some of the intended purposes and not at all for others. We have reported on the areas where usage is low, given the reasons for data not being used, and explained the systemic causes. Though the reasons for not using the data and the causes of the lack of use are widely varied, we have been able to consolidate them under the following headings: awareness, availability, confidence, coverage, detail, utility, understanding, and resources. Given this understanding of the shortcomings of the CCDR system, we can now draw conclusions and formulate recommendations for improving the situation.

V. CONCLUSIONS AND RECOMMENDATIONS

In this chapter, we present our conclusions and recommendations. Our brief statements of conclusions synthesize our findings and lay the groundwork for presentation of recommendations. Our recommendations are presented in two forms—first, we address improvement in quality and usefulness of CCDR data, and second, we present action lists for the key offices involved. Following that, we identify a few other considerations that bear on execution of the recommendations.

A. CONCLUSIONS

The findings of our study have led us to conclude that:

- The need for actual cost data as provided by the CCDR is greater now than ever, and the need will increase with time.
- The quality of CCDR data should be enhanced.
- The usefulness of CCDR data should be improved.

The following subsections expand on each of these conclusions.

1. Cost Analysts Need "Actuals"

We believe that an actual contractor cost data collection system is necessary for the DoD to perform its cost analysis function. This is because actual cost experiences on past and current acquisition programs form the bases of projections of the costs of future systems. There are no alternatives to this practice. When defense cost analysts are faced with projecting future costs, they will get "actuals" one way or another. Furthermore, the need for actuals has increased with the flow of new challenges presented to defense cost analysts, particularly during periods of acquisition reform (e.g., the David Packard period). We are now in the midst of another period of acquisition reform.

More than forty years ago, the DoD committed to the systematic, managed collection of actuals rather than rely on ad hoc, unmanaged, inefficient methods. Building on its predecessors, the CCDR is the current DoD collection system for actuals. This collection system is intended to feed DoD's cost analysis database that is intended to service all DoD cost analysis and program management offices. Other systems (e.g., CPR) collect

mostly different cost data for different purposes, such as projecting the costs at completion of specific contracts.

During the course of this study, we have come to believe that it is clearly more cost-effective to fix and improve the existing CCDR system than to eliminate it or develop a substitute system. If the DoD were to revert to ad hoc, unmanaged collection of "actuals," the overall costs of performing the cost analysis function within the DoD could be expected to rise substantially. The undesirable effects would include increases in uncoordinated, inefficient, duplicative collection activities focusing on non-standard data with limited application. These activities would lower the productivity of cost analysis offices, disrupt contractor activities, increase the costs of obtaining actuals, and result in fragmented data in non-standard form being dispersed to cost analysis offices with no way for others to know what is available or to gain access.

2. Quality of Data Is Deficient and Needs Improvement

The quality of CCDR data, that is, the end products of the current data collection and distribution system, can and should be improved. Formats for reporting have not kept pace with advances in technology and manufacturing, are subject to interpretation, and result in non-standard, inconsistent reporting. These formats need to be revised and updated with a view towards the needs of cost analysts over the next decade. CCDR coverage of all ACAT I programs should be assured. Confidence in the data can be achieved through audit and validation. Audits are needed to ensure that data reported by contractors are, in fact, what is called for in data element descriptions. Validation must occur shortly after data are received and should be accomplished by those who are most familiar with the acquisition program and who possess the authority needed to obtain corrections when necessary.

The participants in our study openly admitted they have not committed the resources required to make the system work as intended. Military Department policies and procedures must be re-established in light of changes in the 5000 series of instructions. Responsibilities must be balanced with authority, and practices must be implemented and backed with adequate resources. Monitorship of the system must be strengthened, starting with OSD oversight. Particular emphasis should be placed on the requirement to use CCDR data or its equivalent to prepare cost estimates (e.g., POEs, CCAs, independent estimates) and reporting of CCDR status at CAIG briefings.

3. Usefulness of Data Has Declined

Nearly all of the Cost Analysis offices participating in our study reported using CCDR data little or not at all. This situation is in contrast to heavy usage around the time the system was established about two decades ago. Between then and now resources formerly directed to the operation of the CCDR system have been redirected to other purposes, absence of validation and audit have reduced confidence in the data, disincentives to collection and use have appeared, gaining access to acquired data has become too hard, and understanding of the need for and uses of the data has faded.

The usefulness of CCDR data can and should be enhanced through a coordinated set of initiatives with associated costs that are small compared to the benefits offered. Data collection should target future needs of defense cost analysts, and disincentives to use must be removed. Existing disincentives include a misperception of OSD inflexibility on level 3 reporting detail, and also hindrances to the transfer of available data from one government office to another. Ready access to all government-owned cost information should be provided by a central clearinghouse. Greater emphasis can be placed on the application of actual costs in forward-looking cost research activities sponsored by the OSD CAIG and the Military Departments. Use can be expected to increase with improved understanding achieved through implementation of educational programs at DAU member universities and training programs at cost analysis offices.

B. RECOMMENDATIONS

In the first two subsections that follow, we offer recommendations that will overcome the shortcomings of the CCDR system and increase the efficiency of defense system acquisitions by improving the quality and increasing the usefulness of the data. In the final subsection, we explain how these recommendations could be implemented by presenting action lists for the key offices that administer the CCDR system.

1. Improve Quality

We offer the following recommendations to improve the quality of CCDR data purchased by the DoD.

a. Revise and Update Data Planning and Collection Instructions

The utility of CCDR data, as perceived by defense cost analysts, would improve if their complaints were considered seriously and corrective action taken. As noted in other parts of this report, practitioners legitimately complained about report content, formats, and

definitions. The CCDR pamphlet needs to be updated. Changes are needed in content, definitions, and formats (particularly the 1921-3 format). *We recommend that a tri-Service team be established and charged with responsibility for updating the CCDR pamphlet and identifying changes needed to the 5000 series of instructions that result from this update.* We believe that contractors and industry associations should be allowed to participate in deliberations. We suggest that Service CCDR Officials represent their Services on this team. We further suggest that the revised wording in the instruction stress flexibility and adaptability by the CCDR system to changes in programs, contracts, and the acquisition environment.

We found that CCDR form 1921-3 was used the least. Nearly all offices made no use of the data in this form at all. We believe this format should be revised to provide data that is known to be needed and useful to defense cost analysts. We suggest the tri-Service team consider our proposed revision to form 1921-3 as described in Appendix H. The revised data structure is that used by IDA to collect indirect cost data directly from defense contractors over the past fifteen years. This series of studies (documented in References [36 through 45]), were conducted to provide data needed to develop methods for estimating the magnitude of indirect costs, methods for separating fixed and variable costs, and also to conduct economic analyses. Implementing the proposed revision to this format would eliminate the need for separate indirect cost data collection efforts.

b. Ensure Coverage

Records of important cost experiences were not purchased. We were advised that programs avoided CCDR reporting even though program dollar thresholds fell well within the limits set for ACAT I programs. In other instances, contract data requirements included in approved CCDR Plans were not placed on contract. *We recommend that mechanisms be established to ensure (1) that reporting is initiated on all programs that fall within the dollar threshold guidelines of the CCDR system and (2) that requirements in approved plans are placed on contract.* The first could be tied to the existing mechanism that officially identifies a program as being in ACAT I. The second could be a simple report by the program office of placement of approved data requirements on contract when that occurs.

c. Conduct Audits

Cost analysts want and need assurances that the data provided by contractors in CCDR reports are accurate and consistent. The DCAA has internal requirements for annual audits of contractors' capabilities to produce CCDR reports and also tests of data provided in these reports. We believe this practice should be continued, enforced and expanded to

include an on-site review at the beginning of a contract. *We recommend that on-site reviews of contractors' capabilities to produce the specific data elements placed on contract be conducted at the start of new contracts and periodically thereafter.* Reports of the on-site reviews at the beginnings of contracts should include clear descriptions of the mappings of accounts from the contractors' accounting systems to the CCDR format elements. These mappings should be updated during periodic reviews to reflect any changes to the contractors' accounting systems. Distribution of audit reports should include the proposed central DoD clearinghouse (See recommendation 2.b. on establishing a central clearinghouse), thereby making these reports available to all cost analysis offices with a need to know.

d. Validate Data Upon Receipt From Contractors

Validation has been an implied rather than explicit requirement of the CCDR system. Systematic validation has not and is not occurring. Cost analysts reported being reluctant to use data that have not been validated. *We recommend that requirements and procedures for timely validation of CCDR data upon receipt from contractors be established and implemented.* We suggest two levels of validation. The first is a check to see if data elements provided by contractors on CCDR formats conform to the contract requirements and data descriptions. This review is best conducted by cost analysts resident at or "matrixed" to support program offices. The second is a higher level review, conducted centrally, to consider cross-Service and cross-contractor consistency in application of CCDR reporting instructions. The latter review could be conducted at the proposed central DoD clearinghouse.

e. Monitor the System

Existing instructions and regulations prescribe data flows and uses that would, if fully implemented, strengthen the cost analysis function and thereby enhance the acquisition process in the DoD. The recommendations offered here, if implemented, would improve the quality and streamline the flow of data from contractors to users. This flow could be established and maintained through aggressive encouragement and monitoring by system officials. *We recommend that implementation of the CCDR system be aggressively and consistently monitored.* The proposed central clearinghouse could play a key role in monitoring the collection, validation, and distribution of data. Service and OSD CAIG cost reviews offer opportunities to discuss the operations of cost collection systems and uses of data.

2. Increase Usefulness

We offer the following recommendations to improve the usefulness of CCDR data to DoD cost analysts and program management offices.

a. Strengthen Incentives and Facilitate Use

During our review, we identified several disincentives to usage of CCDR data by cost analysts. First, cost analysts, mostly those supporting program offices, perceived the level 3 reporting policy to be inflexible. This resulted in development of parallel, duplicative cost collection systems. Secondly, cost analysts in search of data experienced administrative inhibitors to access to needed data. We have two recommendations that will reverse these negative incentives and facilitate use:

- *Reverse Perceptions on Level 3 Detail.* Even though the existing system allows collection of data below level 3, nearly all the government employees that participated in our study perceived this policy to be inflexible and rigidly enforced. We believe this perception can and should be reversed. We fully agree with collection of cost data in standard formats prescribed in Military Standard 881B [12] down to WBS level 3. However, *we recommend program offices be encouraged to collect cost information at levels of detail below WBS level 3 where needed to support both program/contract management activities and the broader cost analysis function of the DoD.* Our investigation of the costs associated with producing CCDR reports indicates that the cost of additional detail is small once the basic computer program is written, certainly a mere fraction of the cost of establishing a parallel cost collection system. We fully support the Department's policy of purchasing only the minimum essential data. When implementing this policy, we suggest that officials at program offices and cost analysis organizations be given latitude when specifying minimum essential requirements.
- *Facilitate Transfer of Data.* Cost analysts with time-sensitive data needs often abandon their quests for CCDR data when told they must obtain permission from the contractor and purchasing Service before being granted access. These barriers to access are not raised by contractors. They are raised by government offices that hold data. *We recommend that DoD offices with legitimate needs for CCDR data be provided that data without further approval from either the contractor that provided the CCDR reports or the Service that purchased the data.* The CAIG should ensure that all government cost analysts needing cost information have ready and easy access to the database. If necessary, we suggest language be included in contracts that explicitly authorizes such transfers from one government office to another. Establishment of the central DoD clearinghouse (proposed in our next recommendation) would facilitate such transfers.

b. Establish a Central Clearinghouse for Cost Information

Finding data and gaining access to it have been major stumbling blocks to usage of CCDR data. The same statement applies to estimating methods (e.g., cost models, cost estimating relationships) developed by individual offices. The offices that participated in this study were unanimous in their support for a central repository and distribution center for cost information. Information would include actual cost data purchased from contractors, routine reports and cost data generated by DoD offices during planning, programming, and budgeting. *We recommend a central clearinghouse for defense cost information be established under the supervision of the OSD CAIG.* The functions of the clearinghouse would include:

- receive, review and store cost information;
- receive, review and store program, performance, physical, and technical (cost driver) information;
- provide DoD offices access to cost and cost driver information;
- inform DoD offices of information that is available; and
- develop and provide statistical summaries of information that is available.

We view the clearinghouse as a support function that would provide individual defense cost analysts with ready and timely access to all cost information available within the DoD. It would be a repository and distribution facility for validated information collected via the CCDR and other cost collection systems, to include CPR, C/SSR, SAR, DAES and budget back-up material (e.g., Air Force Form 1537). Performance, physical, and technical sources would include program CARDs, and selected data elements in CCDR reports (i.e., format 1921-2, entries B5-B7). The types of materials stored and distributed by the clearinghouse could eventually be extended to include research products (e.g., cost-estimating relationships, cost models, relevant studies). Further, non-proprietary extracts and aggregations of data by commodity type could be provided to contributing defense contractors as incentives to full, cooperative government-industry support for the CCDR system.[1]

The core of the clearinghouse would be an information system structured by commodity types and cost elements as per Military Standard 881B and updates and extensions to it. Exploitation of off-the-shelf databases such as the Army-developed INFOARCH (Information Architecture) system would accelerate development of the

---

[1] Reference [46] is an example of the type of information that could be provided to contractors.

information system. Information would eventually flow into and out of the clearinghouse electronically. Search facilities would lead inquirers quickly to commodity types and cost elements of interest and facilitate downloading of information. The system design would include appropriate safeguards to protect proprietary and classified information and control its flow.

One of the first major tasks of the clearinghouse would be to collect, validate, and normalize already existing CCDR data from all sources. These data should also be placed in electronic files (both raw and adjusted) and be made readily available to DoD cost analysts.

c. Target Data Collection to Future Needs

Current practices are forward-looking more with respect to the pending acquisition and less with respect to future needs of the defense cost community. That is, data plans are developed that focus mainly on what will be needed to manage the pending, and perhaps the next contract or so. Less attention is given to future needs for data and methods associated with yet unspecified acquisitions. *We recommend that future data needs by the defense cost analysis community as a whole be systematically identified and used to target data collection on individual programs and contracts.* This can be accomplished by comparing what will be needed in the future to what is available now. One side of this comparison, "what will be needed in the future," is routinely addressed in the evolving DoD Six-Year Cost Research Plan. Examples include methods for estimating the costs of early phases of acquisitions, and the environmental cost impacts of fielding advanced technology systems. The other side of the comparison, a description of "what is available now," is merely a compilation of past and current collection efforts.

The proposed central clearinghouse will include a database containing data amassed via the CCDR and other collection systems. This database, if implemented, will be an evolving compilation of past and current collection efforts. Further, we will suggest the database structure align with the commodities and WBS structures described in Military Standard 881B. This will allow an ongoing assessment of the number of data points available, by WBS element, by commodity type, for use in developing estimating relationships. Information in this form would be useful when comparing "what is available" to "what is needed." The results of such comparisons could guide planning for the purchase of additional data points where needed most, DoD-wide.

d. Emphasize Application in Cost Research

The DoD Six-Year Cost Research Plan, FY 1994-99, identifies "improved contractor cost data" as a research theme for special emphasis. We suggest this thrust be taken one step further. We believe that as quality of data improves, use will increase. *We recommend that future updates to the DoD Six-Year Cost Research Plan place increased emphasis on the application of CCDR data to the development of estimating relationships.* If implemented, this would shift emphasis from collection to application.

e. Improve Knowledge and Understanding

Use of CCDR and other cost data would increase with improved understanding of the data and the opportunities it offers. This can be accomplished by integrating cost-related educational and training segments into ongoing programs at defense universities and cost analysis offices. We have two recommendations in this regard:

- *Develop and Offer Educational Programs.* There are a number of established university courses that offer program management and cost analysis educational opportunities to individuals involved in defense acquisition and resource management. These include program management courses conducted by the Defense Systems Management College, cost analysis courses offered by the Air Force Institute of Technology, and several courses taught at the Naval Postgraduate School. All three are member universities of the Defense Acquisition University (DAU). *We recommend that DAU develop course materials and member universities offer courses, course segments, or short courses on the nature and uses of cost information available within the DoD.* Course materials of the type envisioned (but in other areas) are being developed by DAU and offered at member universities. *We also recommend that periodic government/industry conferences be conducted on the need for and uses of contractor cost information.* Such conferences would be mutually beneficial, allowing contractors to gain a greater appreciation of the DoD's need for and uses of cost data, and affording DoD cost analysts opportunities to learn how contractors assign, account for and allocate costs.

- *Develop and Distribute Training Materials.* DoD cost analysis organizations maintain training programs that include both on-the-job and formal training sessions. *We recommend that training materials be developed and distributed to cost analysis and program management offices for the purpose of training staff members on the nature and uses of cost information available within the DoD.* Possible training materials include computer-based training programs and training videos. The availability of such materials at cost analysis offices would allow integration of training into the work environment. This could be

expected to result in both increased use and improved application of available data, particularly by less experienced staff members.

3. Action Lists

The preceding subsections do not explain how the recommendations are to be accomplished. This subsection contains action lists that indicate the role that responsible offices can take to implement our recommendations. We present separate action lists for the Chairman of the OSD CAIG and the Military Departments.

a. OSD CAIG

We suggest the following actions be taken by the Chairman of the OSD CAIG:

- *Establish a central DoD clearinghouse for cost information.* Initiate changes to the 5000 series of instructions to provide for and facilitate the flow of cost data into and out of the clearinghouse, keeping all interested offices continuously advised of information that is available and facilitating the exchange of this information. Initiate the development of an information system to fulfill the purposes described for the clearinghouse. Provide the resources to implement and operate the clearinghouse. (The resource implications of this action item are discussed in section C.)
- *Identify future data needs of the DoD cost analysis community.* (The information system associated with the central clearinghouse will allow efficient identification of areas where data are needed the most. The system will be able to array available data by commodity and WBS element, thereby revealing shortages. For example, if it were known that modifications to composite airframe structures were being considered for some future time frame, the central database could be searched to identify the amount of data available to develop estimating relationships applicable to such modifications. Such information could be an important factor in guiding the development of data plans on new contracts).
- *Provide for validation of CCDR data.* Initiate changes to the 5000 series of instructions that specifically require validation of data elements upon receipt of reports from contractors. Monitor validation activities established by the Military Departments. Consideration should be given to separate reviews of cross-Service/contractor issues at the central clearinghouse.
- *Change responsibilities assigned to Service CCDR Officials.* Initiate changes to the 5000 series of instructions to assign new responsibilities associated with establishment of a central clearinghouse for cost information, expansion of Service-wide policies and procedures to include validation of CCDR data, and clarification of what is expected in CCDR status reports.

- *Initiate a revision to the CCDR pamphlet.* Unilaterally establish a tri-Service team to accomplish this task, or petition the USD(A&T) to do so. (One part of this revision should involve changes to the format of 1921-3, as suggested in Appendix H. Consider incorporating this revision into DoDI 5000.2-M.
- *Establish a mechanism to ensure full CCDR coverage.* Establish a procedure that initiates development of a CCDR Plan no later than when a program is designated an ACAT I program. Establish a second procedure that ensures that all provisions of approved CCDR Plans are placed on contracts.
- *Provide for CCDR education and training.* Make arrangements with the Director, Defense Acquisition University, to develop educational materials on the subject of cost information and its uses, and also for member universities to offer courses on this subject. Initiate development of training materials (e.g., computer-based instruction, training videos) on the same subject and distribute to DoD cost analysis offices. Conduct periodic government/industry conferences on the need for and uses of contractor cost information.
- *Provide for audit.* Coordinate with DCAA to ensure annual audits, required by existing directives, are conducted. Conduct audits and ad hoc reviews in conjunction with C/SCSC reviews. Revise applicable instructions to establish a new requirement for conduct of on-site reviews by DCAA of contractors' capabilities to produce CCDR data at initiation of new contracts.
- *Provide for distribution of audit reports.* Establish procedures for routine distribution of audit reports to interested cost analysis offices. (This could be accomplished via the central clearinghouse.)
- *Encourage collection of data below level 3.* Continue to require collection of data following the structure specified in Military Standard 881B down to WBS level 3. Encourage collection at levels below level 3 (for the purposes described earlier) during development and approval of CCDR Plans.
- *Use CCDR data when developing independent estimates.* Establish CCDR usage standards and practices by example. Demonstrate the value and usefulness of CCDR data when developing independent estimates.
- *Review CCDR data usage and system status during CAIG reviews.* Review the use of CCDR data for development of Program Office Estimates and Component Cost Analyses, as well as the status (i.e., accuracy, timeliness) of contractor CCDR reporting and validation of data.
- *Clarify annual CCDR status reporting requirements.* Provide Service CCDR Officials with guidance on the desired content of annual CCDR status reports. (We suggest this report include extent of coverage of Service ACAT I and ACAT II programs, status of reporting by program/contract, status of validation of data, and status of DCAA audits and any other reviews by DoD offices).

- *Exploit CCDR data when conducting cost research.* Encourage research activities that exploit and demonstrate the value and usefulness of CCDR data. Continue to emphasize Contractor Cost Data in future revisions of the Six-Year Cost Research Plan.

b. Military Departments

We found that each Military Department organized its cost analysis functions differently. This points out the need for flexibility in cross-Service policies and practices. With few exceptions, we believe the Chairman of the OSD CAIG should provide general guidance to the Military Departments, allowing latitude in the way each decides to fulfill assigned responsibilities. Going one step further, we believe the Military Departments should have freedom to further assign functions and responsibilities as they see fit. For this reason, we do not identify here specific actions for program offices and other offices, such as cost organizations at Commodity Commands.

We suggest the Military Departments be encouraged to take the following actions:

- *Designate a CCDR Official at a level of authority commensurate with responsibilities.* We recommend Service CCDR Officials be designated by position and that the Service positions be no lower in the chain of command than the Directors of the Service cost centers/agencies.
- *Establish Service CCDR policies and procedures.* Taking into account the organizational differences between the Services and the establishment of a central DoD clearinghouse for cost information, Service policies and procedures should be established for:
  - *Planning:* to ensure (1) that CCDR Plans are developed for all programs (and appropriate contracts) that fall within the dollar threshold for ACAT I and ACAT II programs, and (2) that cost analysis offices are included in the coordination chain for CCDR Plans;
  - *Contracting:* to ensure all requirements in approved CCDR Plans are placed on contract;
  - *Collection:* to include collection by electronic means;
  - *Validation:* upon receipt of data from contractors, specifying the relationship between and division of responsibilities among cost analysis offices at Commodity Commands and program offices,
  - *Storage:* either centralized or decentralized;
  - *Distribution:* specifying flows from contractors to the central DoD clearinghouse, to include collection by electronic means of transmission;

- *Use:* in preparation of Program Office Estimates and Component Cost Analyses; and
- *Reporting:* to include CCDR data use and status during CAIG reviews, and annually in a format prescribed by the OSD CAIG.

- *Participate in revision of the CCDR pamphlet.* In cooperation with other members of the tri-Service team, revise and update the contents, definitions and formats of the CCDR pamphlet, ensuring a flexible system that allows changes in reporting as program and contract changes occur, and requiring contractors to develop a map between contractor accounting systems and CCDR format data elements.
- *Provide for Service education and training.* Implement courses developed by DAU at Service universities and facilitate access to courses by Service cost analysts. Contribute to the development of training materials (e.g., computer-based training, training videos) and make these materials available to cost analysis offices.
- *Use CCDR data when developing POEs and CCAs.* Establish procedures that will ensure the use of actual cost data, when appropriate, during preparation of estimates presented at Service CAIG reviews.
- *Review CCDR usage and system status during Service CAIG reviews.* (The same considerations apply here as for OSD CAIG reviews, discussed previously.)
- *Report Service CCDR system status.* Ensure descriptions of CCDR system status and data usage are included in Service presentations made to the OSD CAIG. Provide required annual status reports, in a format prescribed by the OSD CAIG, to include status of validation of data.
- *Exploit CCDR data when conducting cost research.* (The same considerations apply here as for the OSD CAIG, discussed previously.)

C. OTHER CONSIDERATIONS

All offices that participated in our study stated that insufficient resources were allocated to the CCDR system at all levels. Improvement to this situation requires re-establishment of a commitment and allocation of additional resources. A second major consideration is whether the CCDR cost data collection and distribution system should be consolidated and integrated with the CPR and C/SSR systems. We offer the following observations and suggestions.

1. Resources

The need for cost information to support defense acquisition and management is more urgent now than it was decades ago when cost collection systems were initiated. More than twenty years ago, Assistant Secretary of Defense, Comptroller, Charles Hitch committed the DoD to the systematic collection, distribution, and use of these data. This commitment was supported with resources at both the DoD and Service levels. The data made available by the newly established CCDR system and associated "backfill" effort were used extensively in both OSD and Service cost analysis centers/agencies. The early resources initially applied to the operation of the CCDR system have since migrated to other tasks. This early commitment needs to be reaffirmed by redirecting resources back to this important function.

We believe implementation of the CCDR system will require the full attention of at least a small cadre of cost analysts at the OSD level plus modest computer and clerical support. Funds will be needed to develop and maintain a central database and related information system.

There are many ways to establish and place such a group in the current organization. One way would be to establish a Defense Cost Information Service (DCIS) under the sponsorship of the Under Secretary of Defense (Acquisition and Technology) and the direct supervision of the OSD CAIG. Staffing could be accomplished through creation of new billets or re-assignment of billets currently at CAIG member offices. If this option is chosen, we suggest each of the Military Departments assign one or two cost analysts to the DCIS on either a permanent or rotating basis. A separate funding line could be established for the DCIS, to fund development of the central clearinghouse and support its operation. Annual DCIS funding on the order of $3-5 million could bring the CCDR system to full operation, thereby strengthening the stewardship of the hundreds of billions of dollars spent annually by the Defense Department.

During the course of this study we attempted to determine the cost to the government of operating the CCDR system as currently applied to ACAT I programs only (see Appendix I). We were able to identify about $10 million in annual government costs, but that figure is low by a considerable margin because we did not capture all costs. For example, we did not consider the costs associated with ACAT II, III, and IV programs. In addition, our search for applications of CCDR data in cost research activities was incomplete. Furthermore, all government offices reported committing far fewer resources to the operation of the system than needed. For these and other reasons, we believe the actual cost of operating the system could be twice what we estimated.

If we assume the annual cost to operate the CCDR system is about $20 million, the options available to the DoD are (1) to terminate the system (and subsequently pay even more to collect non-standard "actuals," as discussed earlier); (2) to continue to pay about $20 million to operate a system that is broken and ineffective; or (3) to invest about $3 million to $5 million at the OSD level to fix the system by improving the quality and usefulness of the data as recommended in this report, thereby increasing the capabilities and productivity of cost analysis offices and strengthening the defense acquisition process.

2. Integration of Cost Reporting

Our review indicates that the Cost Performance Report (CPR) and the CCDR systems should not be integrated for two major reasons. First, each reporting system has a different purpose and appropriately collects different information on different contracts at different intervals. The CPR is designed to track contractors' negotiated costs to measure cost and schedule performance. In contrast, CCDR reports are used primarily to collect actual contract costs for use in cost estimating. The data requirements for performance measurement and cost estimating are different. For example, the CPR focuses on the "earned value" concept to assess actual cost performance versus budgeted costs. The CCDR focuses mainly on actual (and not budgeted) costs and also on estimated costs at contract completion. The CPR does not provide a recurring and non-recurring cost breakout as does the CCDR, does not require a standard functional structure as does the CCDR, and provides no detailed data about overhead and no progress cost curve data. Further, the CPR does not apply to firm-fixed-price contracts, while the CCDR, under certain conditions, may be collected on these contracts. Reporting frequency also varies widely. CPRs are typically a monthly requirement, while the CCDR is usually a semi-annual or annual requirement.

Secondly, the potential cost savings that would be obtained by combining the two reports would be small. The major costs associated with each of the reporting systems are non-recurring costs required to start up and subsequently change the contractors' automated financial systems. For major contractors, these costs have already been incurred and are therefore sunk. Integrating the two systems would add non-recurring costs to effect the changes at contractor facilities. The difference in the recurring costs of preparing one of these reports rather than two different reports is small and perhaps negligible.

APPENDIX A

SUMMARIES OF SURVEYS

APPENDIX A

SUMMARIES OF SURVEYS

ARMY

Cost and Economic Analysis Center, February 18, 1993

Summary

The Cost and Economic Analysis Center (CEAC) supports the CCDR system as a source of contractor data to develop contract and program cost estimates. The lack of enforcement of CCDR policies and procedures is a major problem with the existing system. Two major factors contribute to this problem. First, the program offices are the CCDR implementation agents but are not the primary customers for the data. Program offices report through the acquisition chain of command while cost analysts, the principal Army customers, report through the financial chain. This divergence lessens the enforcement leverage of the cost-estimating community. Second, cost-estimating data requirements within the Army generally exceed the resources made available by the program offices. CEAC believes that additional resources are needed to review and validate CCDRs and that the priority of CCDRs should be elevated.

The lack of consistent oversight of the CCDR system within the Army creates a wide variety of more specific problems that, in turn, contribute to reduced usage by CEAC analysts. CCDRs are not available on all ACAT 1 programs and contracts at CEAC for two reasons. In some cases, appropriate CCDR reporting requirements are not placed on contract. In other cases, CEAC does not receive the contractually provided reports. Data quality is often suspect because of inadequate validation efforts throughout Army organizations. The OSD policy regarding the level of reporting detail is sometimes not sufficient to effectively support estimation of costs.

CEAC analysts state that the Cost Data Summary Report (1921) and the Functional Cost-Hour Report (1921-1) are the most useful reports. The Progress Curve Report (1921-2) has some utility, while the Plant-Wide Data Report (1921-3) is seldom used. CEAC also noted that CCDRs should be made more flexible to capture needed data when changing

circumstances warrant. For example, the CCDR reporting structure is often established before all the relevant cost drivers are known. The additional level of detailed data about that emerging cost driver(s) must then be collected off-line rather than routinely making them part of the CCDR requirements.

CEAC has been the leader among the military Services in developing an automated database that uses CCDRs. OSD recently selected the Army system, INFOARCH (Information Architecture), as the software prototype for a centralized DoD system. OSD's objective is to have a single system with a common structure that contains all DoD CCDR data, making it accessible to all the Services' cost analysis organizations.

Uses and Utility

CEAC stresses the importance and usage of CCDR data internally, but has been faced with a shortage of people to effectively process and oversee the system. Several specific CCDR deficiencies that significantly inhibited usage and utility are:

- Level of detail is not always adequate either at the work breakdown structure (WBS) level or the functional process category level. For example, CEAC analysts frequently are looking for level 5 cost data on particular WBS elements where the CCDR typically goes to level 3. Program offices sometimes resist requests for more detailed reporting because of the added cost.
- At times, CCDR requirements do not extend to components (e.g., electronics and command and control) that tend to drive program costs, but focus on the primary system (e.g., tank).
- CCDRs generally are not being validated at program offices, command activities or at CEAC. This contributes to widespread inconsistencies in contractor reporting (even within the same program) within cost categories and cost elements.
- CCDRs are not consistently being obtained on firm-fixed-price contracts.
- Current CEAC personnel noted that they have not developed many cost models or cost-estimating relationships (CERs) using CCDR data. More specifically, in the case of models, CEAC developed only one missile model using CCDR data and none for wheeled and tracked vehicles; CCER was uncertain about models for aircraft. However, in the past, Army CERs for aircraft components were developed using CCDR data (for airframes, engines, etc.).

CEAC is a strong proponent of a centralized and automated cost database that includes CCDR; the easy access to a consistent and accurate database will greatly increase CCDR use and value. The INFOARCH system is used to capture CCDR data on all Army

programs whose contracts are at least 75 percent complete. As of October 1992, INFOARCH contained CCDR data on 12 aircraft systems, 20 missile systems, and 3 combat vehicles. The software has since been selected by OSD to serve as the prototype CCDR system that will eventually accommodate all DoD CCDRs. Most of the development work being done on the INFOARCH system is being performed by support contractors.

Report Formats

The Plant-Wide Data Report (1921-3) is seldom used. Currently, analysts focus on understanding and analyzing direct costs and accept indirect costs as an add-on that results from standard allocation procedures. Review and analysis of indirect costs are primarily left to the Defense Plant Representative Office (DPRO) and the Defense Contract Audit Agency (DCAA).

CEAC did not provide any specific recommendations on the cost categories and cost elements contained in each of the four CCDR reports. However, they did have two general recommendations. First, contractor reporting requirements should be more flexible as additional information becomes available on key aspects of the program. This would mean changes to the contract WBS both in terms of the element and the specific level of detail being reported. Second, the CCDR should at least keep track of system definition (i.e., key technical characteristics) as reports are submitted. These data would still have to be supplemented with information from other technical sources.

CCDR Processing

Receipt and maintenance of CCDRs are administratively monitored and controlled within CEAC as a part-time function. Individual CEAC cost analysts are assigned responsibility for reviewing CCDR Plans and Reports. Army CCDR Plans are to be submitted to CEAC for approval; generally, this is occurring with the plans being reviewed by the appropriate analyst. Currently, CCDR reports are subject to limited reviews and validation of data. CEAC was not aware of any DCAA involvement in the CCDR process.

Currently, CEAC estimates that it spends about three-quarters of a man-year on CCDR administration and it would take approximately five man-years to properly administer and oversee the CCDR system. CEAC did not provide an estimate for contractor CCDR preparation costs, because these costs depend on the contract and WBS.

Aviation and Troop Command, May 18, 1993

Summary

The Aviation and Troop Command (ATCOM) Systems and Cost Analysis Directorate stressed the importance and need for the CCDR system to provide contractor cost data to support cost estimating. ATCOM considers the current system to be "broken" for many reasons. First, the CCDR Plan approval and contract implementation processes are not working as intended. Cost analysis organizations generally do not have sufficient leverage over program offices to ensure compliance with policies and procedures. Second, the written guidance in the CCDR pamphlet is not clear, current, or comprehensive. Third, OSD generally does not provide feedback on CCDR submissions not do they help in the interchange of data among the Services.

Resource constraints and the lack of cost analyst experience in using CCDRs have curtailed CER development in recent years. Analysts now primarily use the data when participating in should-cost teams and source selections that evaluate contractors' actual and projected costs. Additional resources and training of assigned personnel would significantly improve usage and permit review and processing of the backlog of CCDRs into the ATCOM automated system. DoD should consider developing a formal CCDR course. ATCOM also indicated that it would be useful to assess the feasibility of integrating some CCDR and Cost/Schedule Control System Criteria (C/SCSC) requirements.

ATCOM supports the concept of a centralized and automated database for CCDRs but is concerned about the misuse of data. Specifically, ATCOM noted that the major disadvantage in the CCDR system is the potential use of data by individuals who are not familiar with either the specific program or with the individual contractors and their accounting systems. Analysts typically need other information about the data such as accuracy, status of data normalization, and contractor accounting policies (e.g., direct versus indirect charging). ATCOM currently does not release CCDR data to other organizations without approval from the program office and contractor.

ATCOM does not think there are any quick fixes for CCDR problems. They recommend that OSD begin taking firm actions to restore CCDR emphasis and oversight. Additional resources should be assigned to the CCDR function. A good start would be to establish one position from each of the Services to work with the CCDR system either directly for OSD or as a special tri-Service group. This group would also be responsible for the centralized database, for revising and maintaining the CCDR pamphlet, and for facilitating the availability and use of CCDR data throughout DoD cost analysis

organizations. The efforts of this group, in turn, would likely result in the services elevating CCDR priority and restoring appropriate administration and oversight.

Uses and Utility

ATCOM notes that effective cost estimating requires that historical cost databases on previous procurements be available, accurate and complete. The CCDR system addresses that need for contractor cost data for use in developing CERs, including those involving parametric estimates, for new and follow-on buys. Presently, cost estimators assigned at the ATCOM and program office levels are using CCDRs to support-should cost reviews and source selection. Until recently, they were also using the data to develop CERs. ATCOM has established an automated CCDR database but has not been able to maintain it on a current basis. The backlog resulted from a shortage of personnel combined with the lack of knowledge and experience on the use of CCDRs by some assigned personnel. ATCOM indicated that training consists largely of on-the-job training because there are no formal CCDR courses available.

ATCOM uses all of the CCDR reports for cost-estimating purposes except the Plant-Wide Data report (1921-3). Unlike some other cost analysis organizations, ATCOM generally did not have difficulty in obtaining OSD approval for level 4 and level 5 contract work breakdown structure (CWBS) when the requests were supported with good specific reasons. ATCOM also prefers that physical, technical, and performance attributes be obtained from the appropriate technical personnel rather than via the CCDR.

ATCOM supports the centralized and automated database concept, but points out that several control procedures should be considered for implementation. First, it may be effective to identify the users of the data to the data owners. This would serve as a starting point to help avoid the possible misuse of data by personnel who do not understand the data and how they were derived and reported. Second, controls over the proprietary CCDR data must be strictly enforced by DoD. Contractors are particularly sensitive to the increased risk of unauthorized data disclosure as access expands dramatically. Third, some level of data validation and normalization must occur centrally to increase reliability and consistency among contractors.

ATCOM provided several specific recommendations to enhance usage that require changes to the CCDR pamphlet. Specifically, the pamphlet should address:

- implications of differences among commodities such as airframes and engines,
- requirement for subcontractor WBSs to comply with Military Standard 881 guidance,

- potential effects of recent acquisition trends, including multiyear procurement, teaming arrangements, increased use of (subcontracted) contractor-furnished equipment (CFE) versus government-furnished equipment (GFE), integrated avionics, concurrent engineering, and continuous improvement processes (e.g., total quality management),
- how to establish WBSs for items not specified within the seven categories of defense systems shown in Military Standard 881,
- more detailed descriptions with examples of the recurring and nonrecurring categories,
- clarify and emphasize the requirement for unit cost reporting in the 1921-2, and
- summarize significant accounting changes in the remarks section of the CCDR report.

ATCOM also suggested that CCDR Plan decisions be documented to provide a clear reporting baseline.

Report Formats

ATCOM is generally satisfied with the 1921 and the 1921-1 formats. ATCOM recommends that the Progress Curve Report (1921-2) be expanded to include engineering and tooling categories. In addition, ATCOM suggests that all the current CCDR functional areas be reviewed for current relevance and for clarity and preciseness in definitions. ATCOM also pointed out that both the CCDR Plan and Report formats should be submitted in electronic formats.

CCDR Processing

ATCOM has a separate division within the Systems and Cost Analysis Directorate that is responsible for CCDR processing to include review, validation, and data entry into the automated system. The cost estimators who use the data are assigned to a separate division. Recently, the processing and use of CCDR data in both divisions have been decreasing. Validation and data input of CCDRs are not current and cost estimators are doing less analysis of the data than in the past. ATCOM was not aware of any DCAA involvement in the CCDR process.

ATCOM was not able to provide any specific estimates for the costs contractors incur in implementing the CCDR system, but indicated that the process should not be expensive. In terms of effort, ATCOM has 11 analysts who do both CCDR and C/SCSC analysis but expects a reduction of three personnel. ATCOM estimates that an additional

one to two man-year equivalents from experienced personnel would enable them to review CCDRs and maintain the automated database on a current basis.

Missile Command, April 15, 1993

Summary

The Missile Command (MICOM) Cost Analysis Division strongly supports the existing CCDR system. It uses the data extensively to develop parametric cost estimates and other cost estimating factors. MICOM considers CCDR data to be more comprehensive for cost estimating than C/SCSC data. For example, CCDR data are required on all types of contracts and distinguish between recurring and nonrecurring costs. MICOM does not consider the program offices (POs) to be significant users of CCDRs. In the MICOM experience, POs tend to rely on other contractor-provided data that they consider more relevant and timely. MICOM also believes that contractors probably view CCDRs as non-value-added reporting because they do not need or use the data.

MICOM noted that the value of the CCDR Plan has been weakened by scaling back the level of detail at which costs are collected because of OSD efforts to limit data-collection levels. The most valuable form to MICOM is the Functional Cost-Hour Report (1921-1). MICOM selectively uses the Cost Data Summary Report as a check for completeness and the Progress Curve Report (1921-2) to support learning slopes and cumulative average costs. MICOM seldom uses the Plant-Wide Data report (1921-3).

MICOM considers CCDR validation to be a key issue. Typically, CCDR data are not verified until being used to develop cost estimates that frequently occur several years after the data were collected. MICOM recommends a more active role for the DCAA in auditing the CCDR system and related reports. MICOM believes productivity gains may be realized by combining selected C/SCSC and CCDR needs such as validation of contractor reporting systems.

MICOM believes that PO support is essential to the success of the CCDR system. MICOM points out that within the government the bill payers (i.e., POs) are typically not strong CCDR proponents and often resist implementation. OSD should consider centralized funding of CCDRs as a way of overcoming this resistance and ensuring that the required reports are included in the contractual requirements. MICOM supports the concept of an automated, centralized database maintained by OSD. The automated system should provide for internal data checks such as ensuring that "other" costs do not exceed a reasonable percentage.

Uses and Utility

MICOM uses CCDR data extensively, particularly the 1921 and 1921-1 reports. The data are used to develop CERs and cost factors for a wide range of missile programs. For example, in March 1990, a cost-estimating team headed by MICOM with support from the Strategic Defense Command (SDC) Cost Analysis Division published "Missile Production Cost Factors" (TR RM-CA 90-1) for six major programs (MLRS, Stinger, Hellfire, Patriot, Pershing II, and the Improved Hawk). The study produced both individual program and generic cost factors.

MICOM believes there are two major reasons why CCDR data are not used more. First, data are not always available because POs do not require CCDRs or do not specify the right reports and level of detail. POs often want to eliminate reports so that they do not have to pay for something that they are not likely to use. MICOM has limited leverage over POs to ensure CCDR implementation. Secondly, the reports frequently require significant "scrubbing" before the data can be used for cost estimating. This results from the data not being routinely validated by POs. In addition, MICOM does not review the reports for accuracy until the data are needed for analysis, which can be several years after the reports were received. In the study referenced above, the team pointed out several problems that still persist today. These included contractors reporting large percentages of costs into "other" categories, inconsistent reporting of system program management costs, and incomplete reporting of all WBS elements.

MICOM noted the need for program technical characteristics in generating parametric cost estimates but preferred that such data be obtained directly from technical sources. This practice avoids potential security classification problems and non-financial requirements being levied on those who prepare the report. MICOM recommends that the contractor reference a source document for technical data in the remarks section of the CCDR report. MICOM also pointed out that the 1921-1 should include hardware quantities, which are especially needed for manufacturing prototypes.

MICOM does not favor including additional data in CCDRs for fixed and variable cost analyses. Such data are typically dynamic and subject to judgments that may be valid for only a particular time frame. Data to support these cost-behavior analyses should be obtained directly from the contractor(s) as needed.

Report Formats

MICOM recommends that the CCDR pamphlet be revised to provide more substantial guidance to contractors in completing the forms. Most importantly, the cost

element definitions need to be expanded and clarified to reduce judgment and interpretation. It may be useful to incorporate examples of current widespread problem areas in cost category reporting.

MICOM indicated that the 1921-1 report may have to be made more flexible to accommodate changing functional summary categories that result from new accounting systems such as activity-based costing (ABC). From MICOM's perspective, the 1921-3 could be eliminated since MICOM uses forward pricing data as needed.

CCDR Processing

MICOM has developed written procedures for processing CCDRs to include reconciliation of CCDR data with Cost Performance Report (CPR) data. MICOM accounts for CCDR requirements and reporting by specific program. Presently, hard copies of CCDR reports are maintained by the responsible analysts. Microfiche copies are also available. MICOM is increasingly making use of the INFOARCH automated database being developed and maintained by the Army Cost and Economic Analysis Center.

CCDR validation is limited and usually occurs when the data are used, whether it be at the MICOM or PO level. MICOM is not aware of any significant involvement of the DPRO or the DCAA in CCDR oversight. Increased participation by these organizations, particularly the DCAA, would enhance data accuracy and consistency.

MICOM could not estimate the cost of contractor costs associated with the CCDR system, although it does not consider them to be significant. MICOM estimated that additional manpower would be required if a comprehensive CCDR system were implemented to include data validation and increased oversight of requirements.

Space and Strategic Defense Command, April 16, 1993

Summary

The Space and Strategic Defense Command (SSDC) Cost Analysis Office is a regular but limited user of CCDR data. SSDC has developed some specific CERs to support its independent cost-estimating responsibility for the Army-managed Strategic Defense Initiative (SDI) programs. SSDC indicated that the value and use of CCDRs may be enhanced by additional oversight and control. For example, CCDR Plans are not coordinated through the SSDC Cost Analysis Office. Rather than routinely receiving all reports, SSDC must ask for CCDRs from the individual program offices as needed. SSDC also noted that data accuracy is often a problem because POs are not generally validating the

data. Total CCDR costs are usually correct, but individual cost data elements frequently contain errors.

SSDC has found that the Cost Data Summary Report (1921) provides a useful output-driven cost breakout. The Functional Cost-Hour Report (1921-1) is much less useful because it does not provide sufficient functional level detail that, in turn, must be separately collected. The Progress Curve Report (1921-2) has not been used because there have not been any deliverable hardware requirements. The Plant-Wide Data Report (1921-3) is not used at all.

SSDC currently obtains technical data to support cost estimating from the Cost Analysis Requirements Document (CARD). SSDC does not believe it is necessary to include such data in the CCDRs. SSDC fully supports the concept of an automated, centralized database that provides ready access to the entire DoD cost-estimating community. Data availability is a key issue with SSDC since it has experienced some difficulty in obtaining CCDR data from other Service cost analysis organizations.

Uses and Utility

The SSDC Cost Analysis Office occupies a unique position in the Army because it is the only organization other than the Army Cost and Economic Analysis Center to have independent cost-estimating responsibility. CCDRs have proved to be a useful source of contractor cost data for developing CERs and cost factors to support their cost estimates.

CCDR usage within SSDC has been hindered by three principal factors. First CCDRs are not always available either from SSDC POs or from other Service cost analysis organizations. POs do not always obtain CCDRs and do not routinely provide them to SSDC. Second, the 1921-1 typically does not provide the detailed functional breakout SSDC needs for estimating. Third, CCDR costs frequently are not reported in the appropriate cost data element category. Such errors take time to correct (assuming they are discovered) and create consistency problems across contractors.

Given these conditions, SSDC notes that data validation must be improved at all levels. In addition, SSDC manpower constraints necessitate streamlining and efficiency in cost estimating. In this regard, SSDC believes that the potential integration of selected CCDR requirements with C/SCSC requirements warrants further consideration.

Report Formats

SSDC intends to require CCDRs on all types of contracts. However, the policy has not been fully resolved because the POs have not yet used firm-fixed-price contracts,

primarily because the programs are still in research and development. SSDC provided the following recommendations on CCDR formats: no changes to the 1921 and 1921-2 reports and expand the functional breakout of the 1921-1 report. SSDC had no comment on the 1921-3 report because it does not use it.

SSDC noted that the CWBS is not always compatible with the WBS structure specified in Military Standard 881-B. This results from the fact that, in some cases, the SDI programs contain new and different output elements than previously observed and included in the standard structure.

CCDR Processing

SSDC does not have written procedures for processing CCDRs. CCDR Plans prepared by the POs are not coordinated through SSDC. CCDR reports, when available, are provided only upon request. CCDR accuracy is suspect, as noted by SSDC when using the data for cost estimating. SSDC does not know the extent that CCDR data are being validated by POs but believes it to be small. SSDC also is not aware of any involvement by the DPRO or the DCAA in the CCDR validation process.

SSDC could not identify contractor costs associated with CCDR reporting. SSDC did indicate, however, that contractors have provided estimates in their contract proposals but the actual cost agreed upon loses its specific identity in the negotiating process. SSDC considers the processing and use of CCDRs to be a normal part of the job. Increased government control and oversight (to include validation) of CCDRs would probably generate the need for additional manpower at SSDC and/or the individual program offices, depending upon specific responsibilities.

Comanche Program Office, May 18, 1993

Summary

The Comanche Program Office supports and uses the CCDR system as an important source of contractor cost data. The program office recently used CCDR data to help build the program baseline cost estimate. The CCDR data structure is also used as the framework for comparing the prime Comanche contracting team of Boeing and Sikorsky. The PO has not yet developed any CERs based on program-specific cost data because it is too early in the acquisition life cycle.

The PO routinely uses the data in the Cost Data Summary Report (1921) and the Functional Cost-Hour Report (1921-1). The PO is not using the Progress Curve Report

(1921-2) yet because of the early stages of the program. The PO periodically uses the Plant-Wide Data Report (1921-3) to assess the cost effects resulting from changes to the contractor's business base. In an effort to save funds, the PO recently reduced the reporting frequency for the 1921 and 1921-1 reports from semi-annually to annually for the two prime team contractors. This reduction involved the separate CCDRs for each contractor and the combined CCDR for both contractors and resulted in an estimated $2.5 million in cost savings over a five-year period (FY 1993-1997).

The PO noted several problems with the existing CCDR system. First, there is a lack of emphasis on CCDR administration and oversight throughout OSD and the Army. Second, organizations are not devoting sufficient resources, particularly to CCDR data analysis and to a lesser extent to cost-estimating methodologies. Third, the CCDR pamphlet does not always provide clear definitions such as recurring versus nonrecurring cost categories. Fourth, CCDR policies and procedures are sometimes too restrictive (e.g., report frequency), and OSD is often inflexible in its administration.

The PO has serious reservations about developing and using a centralized database. It is primarily concerned with people misusing the data in developing cost estimates because they do not understand the contractors' accounting and reporting systems. Secondarily, the PO is concerned about the general accuracy of CCDR data given the apparent lack of validation being done. The PO highly recommends that program cost analysts be required to develop a cross-walk between the contractor's accounting system and the CCDR reports at the time the contract is awarded.

Uses and Utility

The PO described the CCDR system as a four-step process: data collection, data analysis, methodology development, and cost estimation. During recent years, the PO has observed a major shift away from the data analysis step, which has negatively affected the other steps and the overall system. The data are not validated and normalized, which significantly reduces the potential to develop cost models and cost-estimating relationships. The lack of current and relevant methodologies limits the utility of the data for cost estimating, particularly as applied to other similar programs. Finally, the limited utility provides disincentives for many program offices that do not like paying for data that are not being used.

In the current environment, the PO is selectively using CCDR data to develop baseline cost estimates and to compare costs of the prime contractors. Knowledge and understanding of the contractor's accounting system are essential to using CCDR data that

accurately and consistently reflect contractors' operations. For example, the PO noted that several contractors involved in helicopter development and production are now using various approaches to reclassify indirect costs as direct costs. One technique is to develop direct distributables which represent cost factors for charging to direct what otherwise would have been classified as indirect (e.g., financial report preparation). Such accounting changes result in the appearance of lower overhead costs through declining rates, when, in fact, there is no change in total costs but merely a shift in cost categorization from indirect to direct. For this reason, the PO focuses on total costs and not direct costs or direct hours for estimating purposes.

The PO pointed out that it is not normalizing or validating the data, a practice that limits the data's usage by external parties who may not be familiar with the program or the contractors and their accounting systems. Data adjustments require substantial effort that the PO does not consider to be warranted given the limited local resources and the perceived lack of concern and priority for the CCDR system shown at the Army and OSD levels.

The PO did not see any significant benefits for integrating C/SCSC with CCDRs. Cost estimators, and not C/SCSC analysts, are concerned about the WBS content, program cost estimates and parametric estimating for new programs. Accordingly, cost estimators must be directly involved in all phases of CCDR analysis. The PO also prefers to obtain needed technical characteristics about the program from technical people rather than incorporating the requirements into the CCDR system. During the research and development phase, the PO considers programmatics (e.g., acquisition strategy, technology, and flight hours) to be even more important than specific technical characteristics, and believes these must routinely be collected outside the CCDR system.

Report Formats

The PO is generally satisfied with the CCDR formats but recommended a few areas for improvement. The 1921 report should be at a lower level of WBS detail to make it more compatible with the functional details contained in the 1921-1 report. The PO suggested that contractors include in the remarks section comments about general accounting philosophy and major changes in accounting practices. The PO considers the quality control functional breakout to be of minimal value in the 1921-1 report, particularly during research and development.

CCDR Processing

CCDR Plans are processed through the Aviation and Troop Command (ATCOM) Systems and Cost Analysis Directorate, the Army Program Executive Office (PEO), the Cost and Economic Analysis Center (CEAC), and finally to OD(PA&E). CCDRs are routinely provided to ATCOM, CEAC, and PA&E. At the present time, neither the PO nor ATCOM validate the CCDR reports. The PO is not aware of any DPRO or DCAA involvement in the CCDR process. The PO recommends that the contractor be provided with contractual incentives (e.g., part of the award fee) to provide reliable and accurate reports.

The PO noted that it had achieved estimated savings of $2.5 million over a five-year period for reducing the CCDR requirements from semi-annually to annually. The precise savings could not be specified because contract negotiations were conducted based on a much higher level of aggregation. While the $2.5 million cost savings is significant in absolute terms, it represents only about 0.12 of 1 percent of the $2.070 billion contract value. As previously noted on the government side, the PO strongly recommends that more cost analysis resources be devoted to CCDR data analysis.

Air-to-Ground Missile (Hellfire) Program Office, April 15, 1993

Summary

The Hellfire Program Office generally concurs with the need for the CCDR system. From the PO's perspective, CCDRs are most useful in production and of limited use in research and development (R&D). The PO has developed CERs for internal use and for validation of other estimates. The data also have been used in a PO study to show the cost effects of the program acquisition strategy involving dual-source and winner-takes-all procurement. The PO pointed out that historical CCDR cost data must be used with caution because the CCDR reports do not specify for what quantity and configuration the data are provided. In cases where the PO requires analyses on fixed and variable costs, the data are available from other contractor-provided data and reports. The PO also considers the CCDR to be an effective source of program cost history.

The PO notes that the contractors view the CCDR as being non-value added because the reports only provide benefits to the government and not the contractors. The contractors do not need CCDRs but are subject to government criticism and questioning based on the data. The costs associated with contractor CCDRs are difficult to estimate because of contract negotiations based on consolidated data packages that include CCDRs,

preparation costs accounted for as indirect charges, and the general absence of time-accounting systems that record actual time at detailed levels (e.g., CCDR).

The PO believes that the major disadvantage of CCDRs is the OSD-mandated use of the same WBS for both the C/SCSC and CCDR systems during R&D. The R&D phase involves many unique contractor activities that do not readily fit into a standard structure. The result is a C/SCSC structure that is less than adequate for contract management and control because of the external need for a cost database that requires a common structure.

The PO expressed reservations about the use of a centralized, automated database that is accessible to the entire DoD cost-estimating community for two primary reasons. First, the user must understand the data and the program, including access to key technical characteristics. Second, the accuracy of the data may be suspect without a well-defined and disciplined validation system.

The PO generally believes the quality of its CCDR reports is high because of the contractors' efforts to ensure that accurate products are distributed to the designated recipients, including the DCAA and the OSD CAIG. PO analysts usually verify when they use the data rather than reporting at the time of receipt.

CCDR Uses and Utility

CCDR data are used selectively within the PO to support cost estimates and to perform special studies. The PO develops CERs for use in analyzing and verifying cost estimates developed with other methodologies. The PO uses these CERs to support production estimates, but not R&D estimates, that are submitted to higher headquarters for review. Such estimates require that the analyst using the data is responsible for the accuracy of the data used. The analyst is also responsible for knowing the physical and performance parameters of the systems used in generating the CERs.

The PO views the CCDR system as being externally driven to provide a cost database. That database should be readily available for use with minimum effort by cost analysts throughout DoD. Effective use of such a database usually necessitates that the analyst be familiar with the program and the contractor, and have access to key technical data (for potential use as independent variables) that relate to the cost data. The PO believes that the database can be misused easily without these data, which currently are not part of the CCDR reporting system. The PO is against including technical data in the CCDR and feels such data should be obtained directly from technical personnel or reports. This procedure best preserves the accuracy of both the cost and technical data.

The Cost Data Summary Report (1921) and the Functional Cost-Hour Report (1921-1), and the Progress Curve Report (1921-3) are most useful reports during production. In developing cost estimates during R&D, the PO ordinarily uses C/SCSC data rather than CCDR data. A significant drawback of the 1921 and the 1921-1 is that two or more configurations can be reported in the same report. The Plant-Wide Data Report (1921-3) is not used at all. The PO uses indirect costs and related supporting data from the forward pricing rate data available from the Defense Plant Representative Office (DPRO) and DCAA.

A major drawback of the CCDR system is its use as the principal driver for the contract WBS that must also be used by the C/SCSC reporting system during the R&D phase. R&D involves many unique activities that may have to be related to unique output for management and control purposes. Without a more flexible WBS, contractor cost accounts have to be allocated to WBS elements other than what the contractor is actually managing. This forced structure limits PO visibility into contractor operations and related cost effects. The preferred approach is to allow for some departure from the standard structure during R&D. On the other hand, production activities are not unique and can much more easily adapt to the standard structure.

Report Formats

The PO generally does not have significant problems with any of the report formats. However, the PO did note that CCDRs probably would be required only during production in the absence of CAIG direction. The primary difficulty with CCDR data is in establishing and maintaining consistency in cost categorization among contractors between direct and indirect and between recurring and nonrecurring.

CCDR Processing

The PO has not documented any formal procedures for administering the CCDR system. However, CCDR Plans and Reports are typically processed as follows. CCDR Plans are coordinated with Missile Command (MICOM), the Program Executive Office (PEO), the Army Cost Center, and the CAIG. CCDR reports are obtained on all contract types and are routinely distributed to the DPRO, DCAA, MICOM, Materiel Command, and the CAIG. The major obstacle in CCDR processing occurs at the OSD level where the tendency is not to listen to the needs of the PO but rather to focus on OSD needs and concerns for data.

The internal PO cost of overseeing the CCDR system is small. The CCDR focal point spends time during CCDR Plan preparation and coordination and contract negotiation. PO cost estimators consider the processing and use of CCDR data to be a routine part of the job.

The PO noted that availability of CCDR data from other DoD organizations varied. Other program offices were usually very cooperative while the Service cost centers/agencies and the CAIG claimed they could not find or were unwilling to provide the CCDR data.

NAVY

Naval Center for Cost Analysis, January 29, 1993

Summary

The Naval Center for Cost Analysis (NCA) is currently making minimal use of CCDR data due primarily to resource constraints. NCA is quick to note the value and potential usage of CCDR data in developing CERs and models and generally improving its overall cost analysis capability. However, at the present time, NCA is only able to assign one individual on a part-time basis who spends approximately one-third of his time to oversee the CCDR system. NCA estimates that at least two full-time positions are required to manage the program. Existing resource levels and other higher priority cost analysis needs preclude NCA from assigning any additional personnel at this time.

NCA clearly points out that increased emphasis and support from OSD are absolutely essential if the CCDR system is to serve the cost analysis community as intended. Given the general downsizing within DoD, all organizations within each of the services are competing for declining manpower. OSD efforts to enhance CCDR viability must be extended beyond the narrowly defined boundaries of cost analysis organizations to include the much broader acquisition management function (e.g., Naval Systems Commands). The bottom line for success is top management commitment and emphasis that translates into additional resources that are earmarked specifically for CCDRs.

Uses and Utility

NCA is using hard-copy CCDR data, at least in part, for one-time cost estimating efforts on individual programs for aircraft (about 80 percent of the time), electronics (about 25 percent), and missiles (roughly 25 to 50 percent).

NCA specifically identified the recurring and nonrecurring breakout on the 1921 report as being critical for cost estimating, and the CCDR system is the only established reporting mechanism that routinely generates the data. NCA has not established any automated databases for CCDRs. The models and CERs that NCA develops that include CCDR data come from hard-copy reports manually input into statistical programs and spreadsheets.

In addition to a shortage of manpower to work the CCDR issue, usage is hindered by the lack of knowledgeable and experienced people. This is due in part to the absence of formal training courses within DoD.

Report Formats

Specific recommendations for improving report content were limited because of the lack of experience in using CCDRs within NCA. However, several general improvement areas were identified. NCA believed that the value of 1921-2, Progress Curve Report, was suspect and could be a candidate for elimination. NCA noted, however, the reporting of physical, technical, and performance attributes (shown as characteristics on the 1921-2) such as weight, size, and speed were useful but may produce a classification problem. Current CCDRs are typically unclassified while many of the desired program attributes may be classified. NCA also mentioned that the 1921-3, Plant-Wide Data Report, was often used in its cost analyses (e.g., McDonnell Douglas and Northrop for a recent F-18 cost analysis), but pointed out that the same information is available from other sources.

Data consistency across contractors often can be a problem because companies have different accounting systems and different interpretations of the various cost categories and cost elements. For example, nonrecurring engineering costs are sometimes included in manufacturing costs. Overhead rates also vary significantly among contractors due in large part to differences in accounting interpretations. NCA has generally considered the implications of new accounting systems such as activity-based costing (ABC). They know such accounting changes would likely change the need for and content of cost-reporting data, but have not yet had the opportunity to do any detailed analysis.

NCA agreed that a centralized (OSD) and automated database that could be developed, maintained, and made available quickly would be desirable if resources could be made available and agreement on policies and procedures among OSD and the services could be reached. Finally, NCA agreed that it might be worthwhile to explore the feasibility of integrating CCDR administration requirements with other reporting systems (e.g., cost

performance measurement). A single office within OSD would be responsible to manage and oversee all contractor cost reporting as specified in DoDM 5000.2.

NCA raised the issue of total program costs. CCDRs only provide part of the answer. Other government (e.g., laboratories) costs and contractor costs not covered by the CCDR system would have to be obtained from other sources to produce a program-level cost estimate.

CCDR Processing

Until now, NCA has not been in the loop in determining individual program CCDR requirements (CCDR Plan processing). NCA regularly receives ACAT 1 Program CCDRs from NAVAIR concurrently with distribution to OSD, but is not on distribution for on NAVSEA CCDRs. CCDR distribution is made by each SYSCOM's cost group. NCA obtains copies of CCDRs by request routinely from NAVAIR, and from NAVSEA by request on approval from program offices. NCA does not perform quality reviews of its own and notes that the overall CCDR system has a reputation for reliability. The implementation of SECNAVINST 5000.2A will strengthen NCA's role as a key player in the Navy CCDR review process, including regularly receiving all CCDRs.

NCA also noted that program managers focus on individual contract costs for their specific programs. Establishing databases and developing cost models and CERs for other programs are of much lesser importance. As a result, what the program manager is able and willing to buy (and actually buys) is at times different than the needs stated by the cost analysis community.

Naval Air Systems Command, March 4 and April 8, 1993

Summary

The Naval Air Systems Command (NAVAIR) Cost Analysis Division is a strong advocate of the CCDR system. In its view, the system represents the only standard and systematic way of collecting contractors' actual costs into a DoD-established structure for cost-estimating purposes. NAVAIR believes CCDR quality and usage would increase significantly throughout DoD if sufficient resources were devoted to the effort from the top echelons at OSD through the services and down to the individual program offices. A portion of the additional resources should be spent developing and providing CCDR training to the cost analysis community.

NAVAIR has implemented and documented effective procedures for managing and overseeing the CCDR system. NAVAIR notes that the key to successful data-gathering is twofold. First, NAVAIR makes an up-front investment in time to develop a good CWBS and to identify and coordinate specific reporting requirements both internally and with the individual contractors. NAVAIR ensures cost analysis participation in the contractual process by requiring coordination on the procurement request to initiate the formal contractual process. Second, government cost analysts who are knowledgeable of both the contractor and the program must periodically validate the data as reports are received. NAVAIR's experience indicates that it is difficult for anyone else to go back well after the fact for the purpose of identifying and correcting errors in cost data reporting. NAVAIR readily acknowledges that the current validation process is limited because of manpower constraints.

NAVAIR maintains a hard-copy database of all CCDR reports. It considers the database to be the prime source of contractor costs for parametric estimating and have developed numerous cost models and CERs from the data. Quality of the data is still a concern for NAVAIR because NAVAIR lacks sufficient resources to consistently review and verify the accuracy of reports as they are received. Data accuracy is partly achieved through the early (at the beginning of the contract) government and contractor understanding and agreement on how the CCDR data should be categorized and reported.

NAVAIR supports the concept of a centralized and automated database for CCDR data. The function of establishing and maintaining the database should include adequate manpower to centrally validate the data at least at the macro level. Detailed verifications would still have to be performed by or in coordination with those Service cost analysts at the headquarters, major command, and program office levels who are most familiar with specific programs and contractors. NAVAIR generally does not consider the costs of contractor report preparation to be significant. While NAVAIR notes that some contractors have estimated CCDR costs to be high, such costs were usually found to be overstated /or the result of inefficient manual procedures used in preparing the report.

Uses and Utility

NAVAIR obtains CCDR data on all types of contracts, including firm-fixed-price contracts. NAVAIR makes extensive use of the Summary Cost Report (1921) and the Functional Cost-Hour Report (1921-1) to develop models and CERs and generally to perform the contracting and program-estimating function. The principal value of the CCDR

is that it is the single, systematic, cost-effective means for acquiring historical cost data, normalized in accordance with DoD-wide standard definitions of functional cost elements.

Government cost-estimating databases must be homogeneous. Contractor cost accounting systems are unique to the individual contractor (e.g., the content of tooling labor in one company will differ from that in another company). DoD cost analysis organizations have neither the resources nor the required information to disaggregate and reaggregate raw contractor cost data into consistently defined functional elements of cost. In using 1921-1 data, NAVAIR notes that, more and more, formerly indirect costs are going into direct labor, which represents a significant portion of data for use in cost estimating.

NAVAIR does not obtain as much utility from the Progress Curve Report (1921-2) and the Plant-Wide Data Report (1921-3) as perhaps do the higher echelons. From NAVAIR's perspective, these reports could be eliminated. However, NAVAIR recognizes that the data may be of value at higher levels where alternative data sources may not be readily available. NAVAIR uses forward pricing rates and supporting data obtained from the DPRO in place of the 1921-3 report.

NAVAIR recommends that all restrictive statements related to CCDR reporting and firm fixed-price contracts be deleted from the CCDR pamphlet and from *DoD Instruction* 5000.2 and 5000.2-M. Contract type has nothing to do with the need for acquiring actuals on a given contract in order to maintain good cost-estimating databases.

NAVAIR obtains technical data for parametric estimating primarily from the responsible technical managers in NAVAIR. NAVAIR is opposed to incorporating such data into the CCDR because the reports are prepared by financial personnel. Requiring financial personnel to report technical data may detract from primary cost reporting duties and may result in less accurate cost and technical data. Inclusion of technical data may also present a security problem because such data are often classified. Presently, most CCDR data are proprietary but unclassified. NAVAIR believes that more reliable data can be obtained from other available technical sources without compromising the quality of cost data.

NAVAIR expects the WBS product cost orientation of the 1921 report to remain viable in any cost-estimating environment, including new accounting systems such as ABC. On the other hand, the 1921-1 is directed towards the functional process that produces the WBS output. These aggregate functional categories (e.g., engineering,

manufacturing, and quality control) may change under accounting systems like ABC, although NAVAIR has yet to see any sign of it.

CCDR use and utility may be improved with the development and implementation of a centralized and automated system that is accessible to the DoD cost analysis community. NAVAIR had developed an internal, automated system several years ago but for the past three years has not had the resources to enter the data. A contributing factor is the limited user-friendliness of the current system. NAVAIR has also successfully tested an electronic data interchange (EDI) of CCDR data with McDonnell Douglas. The project has since been suspended pending development of DoD EDI standards and the OSD pursuit of an automated DoD-wide CCDR system.

Report Formats

The 1921 and the 1921-1 reports are usually required throughout the life of the contract. Both reports are required semi-annually throughout development and the first few years of production. Reporting is usually reduced to annual submittals thereafter. Some reporting of lower level WBS elements will generally be delayed until contract completion. A contractor does not have to submit a 1921-3 on a particular NAVAIR contract if that contractor is providing one on another NAVAIR contract. The 1921-2 is sometimes deleted from lesser contracts where its appropriateness is questionable. The 1921-2 is normally required on a quarterly basis and the 1921-3 on an annual basis.

NAVAIR asserts that the CCDR is inadequate as a data-collection structure for some commodities, particularly unmanned air weapons and avionics. NAVAIR would alter the CCDR to provide for the following breakouts:

- engineering hours incurred in support of manufacturing operations,
- special test equipment within the tooling category,
- quality control labor incurred for inspection and test, and
- manufacturing labor incurred for fabrication and assembly.

NAVAIR indicated that it may be worthwhile to require a narrative explanation (in the remarks section) about major changes in contractor accounting systems that affect the way data have been and will be reported.

CCDR Processing

NAVAIR routinely coordinates CCDR Plans with the Naval Cost Center and the OD(PA&E) and provides for regular distribution of CCDR reports to them. NAVAIR has

established a highly effective system to ensure the appropriate CCDR reports are placed on contract. Occasionally, however, program offices have successfully resisted placing CCDR requirements on contract.

NAVAIR vigorously opposes combining CCDR and the Cost Performance Report (CPR). The two reports are for distinctly different purposes. The purpose of a CPR is to provide monthly visibility into the status of a contract in terms of objective, quantitative measures of work accomplished (i.e., earned value) and contrasted against a performance measurement baseline. It must necessarily be structured in terms of the contractor's unique accounting system. The CCDR, on the other hand, is for the purpose of maintaining a homogeneous cost database for cost-estimating purposes. Cost data reported for the CCDR must necessarily be reaggregated into standard, consistent definitions of functional cost categories. The necessary depth and frequency of reporting differs dramatically between the two. The cost-estimating discipline on the one hand, and contractor performance measurement and C/SCSC on the other, are different full-time disciplines and are performed by different people in most DoD and contractor organizations. NAVAIR believes that anyone who advocates combining the two reports must lack an understanding of one or the other.

NAVAIR is open to the suggestion that on-site CCDR reviews be standard at the start of major program contracts to ensure proper CCDR preparation. This should be done by cognizant cost-estimating personnel. Such reviews should not be part of C/SCSC reviews.

Quality control is primarily the responsibility of the individual analyst who uses the CCDR. The time within NAVAIR that is devoted to validation has declined as available cost analysis resources have decreased. DCAA generally has not been involved in the CCDR validation process.

Naval Sea Systems Command, April 6, 1993

Summary

The Cost Estimating and Analysis Division assumed CCDR responsibility for the Naval Sea Systems Command (NAVSEA) in 1987. Since that time, the division has been increasingly emphasizing the use of CCDR data to estimate future costs for weapon system programs and contracts. Data are used extensively in missile, torpedoes, and weapons system costing and to a lesser extent in ship costing. Missile programs generally follow the standard missile WBS prescribed in Military Standard 881. Missile CCDR data are

considered to be accurate and are widely used. Conversely, shipyards frequently depart from the standard ship WBS and require a detailed mapping process to assign costs in the standard WBS and CCDR cost elements. The methods used by individual shipyards to achieve these conversions are still evolving and have not yet produced consistently reliable results. This, in turn, limits the use of CCDR data in developing ship cost estimates. In these cases, NAVSEA cost estimators generally use the cost categories and costs collected in the contractor's accounting and estimating systems.

NAVSEA provided the following recommendations and comments to improve the CCDR system.

- Ship-related reports should be submitted no more frequently than semiannually and should be tied to program events rather than just to time intervals. Another option followed by NAVSEA is to require interim CCDR reporting only when actual costs exceed targets by some threshold such as 10 percent.
- The CCDR system should require formal procedures for tracking and documenting contract changes (e.g., engineering change proposals) similar to that required for the Cost Performance Reports (CPRs).
- OSD should provide strong leadership and guidance to provide the military cost analysis community with the necessary high-level impetus for fully implementing and overseeing the CCDR system.
- It would be worthwhile to consider integrating selected C/SCSC functions with CCDRs (e.g., training).
- NAVSEA noted that data reporting is not consistent among contractors and is sometimes not even consistent from one contractor who is reporting on several contracts. A brief narrative description, provided by the contractor, may be useful in disclosing cost category assignment that may either not be obvious or be different from what was previously reported.
- The inclusion of technical data that relate directly to the costs being reported may be a valuable addition to facilitate parametric estimating.
- While supporting the centralized and automated database concept, NAVSEA prefers some controls to limit access (perhaps by commodity type) or at least to alert the owner of the data when another office extracts data from the database.

Uses and Utility

In 1987 responsibility for CCDR administration within NAVSEA was assigned to the Cost Estimating and Analysis Division. Previously, CCDR oversight was the responsibility of a now defunct acquisition directorate. The directorate did not use CCDRs in their work and, accordingly, paid little attention to making them a contractual

requirement or validating report quality when they were required. Currently, the cost division is emphasizing the need and use of CCDRs but, at the same time, is being judicious in implementation. For example, report coverage is less extensive than CPRs and is required much less frequently. Typically, reports are required right after contract award, at times that are often dependent upon threshold breaches (e.g., actual costs exceed target costs by more than 10 percent), and at contract completion.

NAVSEA has experienced the most success in using CCDRs to estimate costs on missile systems. Contractors provide very reliable cost data in the standard WBS structure for missiles and can easily map to the CCDR cost categories. NAVSEA has developed numerous CERs and models to estimate individual missile system contracts and program costs. For example, the cost division uses these CERs to perform "sanity checks" of contractor estimates submitted in response to requests for proposal (RFPs).

CCDR utility for estimating ship cost is still gradually evolving. Shipyards have traditionally developed unique WBS structures for their own use that have also been acceptable for CPR reporting. The focus is on geographical zones and systems. Reporting in the standard ship WBS specified in Military Standard 881 and in the CCDR-required cost categories requires the shipyard to develop detailed mapping (cost allocation) procedures that have not yet produced consistent and reliable results. As a result, CCDR data are used selectively to estimate ship costs. NAVSEA cost estimators primarily use the unique shipyard WBS costs rather than CCDR data to estimate costs. Shipyards are now gradually progressing towards providing and using standard WBS and CCDR formats. NAVSEA reported that shipyard cost design engineers are also beginning to see the value of standard CCDR type data in affordability analyses, cost-tradeoff studies, and cost-reduction activities.

The utility of CCDRs may be enhanced by including key technical characteristics that are likely to serve as independent variables in developing parametric cost estimates. These characteristics should be identified during the CCDR planning process with the option of updating the requirements as additional information becomes available about relevant cost drivers. The quantitative measurements of these characteristics (e.g., weight) are also likely to change over the acquisition life cycle and must be reported with the costs that are directly affected.

Fixed and variable cost analyses are also becoming more important with the dramatic shift in procurement quantities. Presently, NAVSEA obtains some relevant data for these analyses (e.g., business base and value of capital assets) from other sources such as the supporting contractors. While the need for that type of data exists, the interpretation

of fixed versus variable is not always clear. NAVSEA notes that this area probably warrants further study to identify specific data elements to enhance analysis of cost behavior.

Report Formats

NAVSEA generally supports the content of the existing CCDR formats. However, NAVSEA requires a separate overhead report from shipyards on an annual basis that is believed to provide more detailed and meaningful data that is much easier for the contractors to prepare than the 1921-3 (Plant-Wide Data Report).

NAVSEA does not provide formal Navy CCDR guidance. The DoD CCDR pamphlet provides adequate guidance to complete the CCDR forms. However, contractor interpretations of cost categories vary among contractors and, in some cases, vary within the same contractor across two or more contracts. Such differences could be more easily resolved if accompanied by a short narrative that explains items that do not clearly track to the formal WBS definitions (Military Standard 881) or to the CCDR cost category definitions (CCDR pamphlet).

NAVSEA also noted that major contractual changes such as those produced by some engineering change proposals (ECPs) are not accounted for or explained separately in the CCDR. They recommend that formal procedures similar to those required for CPR reporting be adopted.

CCDR Processing

Coordination of ship CCDR Plans is largely confined to NAVSEA. Plans are not coordinated with the NCA or OD(PA&E) on a regular basis. There is no formal system for tracking and controlling receipt and distribution of CCDRs to individual NAVSEA cost analysts. In addition, CCDR reports are not routinely distributed to the NCA or to PA&E. However, copies are readily provided to these organizations upon request.

NAVSEA did not know how much it cost contractors to prepare CCDR reports. However, NAVSEA considers contractor costs to be significant primarily when establishing the system. Recurring costs for report preparation are believed to be small. NAVSEA resources to administer the system also could not be identified but NAVSEA feels CCDR requirements can be satisfied within existing resources.

CCDR quality control is primarily the responsibility of individual cost analysts. The quality effort varies with the knowledge, experience, time availability and other workload priorities. NAVSEA differs from most other DoD organizations that we are familiar with in

that its cost analysts do both C/SCSC analysis and cost estimating. Usually these two functions are separated and performed by different individuals. In NAVSEA, only the C/SCSC validation function is separately and independently performed. NAVSEA is not aware of any DCAA work to validate the contractor CCDR systems.

NAVAIR Cost Division/F/A-18 and Air-to-Air Missile Program Offices,[1] November 9, 1993

Summary

The PO cost estimators said they generally do not use CCDR data in developing specific program cost estimates. Estimates are based on contractor accounting data that best support the PO cost-estimating methodology. The PO said that CCDR data are at times used as a starting point for estimating by analogy. Additional work then has to be done to validate and normalize the data as well as map to appropriate data elements needed for the estimate. Currently, the CCDR Plans are routinely prepared and incorporated into the contractual requirements. However, little is done with the reports after they are received. Specifically, the reports are filed but are not validated or used. The PO reports the principal benefit of the CCDR system is to serve as a contractual lever to force the contractor to develop the capability to produce data at the desired level of detail.

The PO representatives indicated that the CCDR system could be improved by:

- providing the program offices more flexibility in determining level of reporting (below level 3) and reporting frequency over a minimum requirement established by OSD;
- requiring the contractors to provide "road maps" with the CCDR reports that show how their accounting system data can be tracked to CCDR data;
- including the CARD as part of the CCDR database to provide access to program, technical, performance and schedule data;
- requiring the contractor to disclose major accounting changes and their impact on the CCDR; and
- facilitating access to data such as establishing an automated, centralized database for performing top-level cross checks of program estimates.

The PO representatives reported that the status and use of the CCDR system data have not been a subject of discussion at CAIG presentations.

---

[1] The Naval Air Systems Command (NAVAIR) Cost Analysis Division provides cost analysis support to individual NAVAIR program offices through matrix management. We met with the chiefs of the two cost-estimating branches that supported the F/A-18 and Air-to-Air Missile Program Offices.

Uses and Utility

The Navy representatives reported that CCDRs are used for requesting information before contract award as a common baseline to compare contractor costs to support PO evaluations of requests for proposal (RFPs). However, once the contract has been awarded, CCDRs are of little value to them for program cost estimating and are seldom used. The representatives said it is easier for the cost estimator to obtain data directly from the contractor's accounting system rather than work with CCDR data that may not be in the right format and may be of questionable quality. The PO representatives noted that OSD is a rigid enforcer of level 3 WBS reporting. This contrasts with the PO requirement for much lower levels of detailed data in selected areas to understand cost drivers and to develop CERs. This invariably leads the analyst to request the needed data directly from the contractor.

The PO reported that CCDRs are used periodically for estimating by analogy. The reports serve as a starting point for capturing needed and relevant data. In these cases, the PO analysts mostly use the Cost Data Summary Report (DD 1921) and the Functional Cost-Hour Report (DD 1921-1). The Progress Curve Report (DD 1921-2) is not used at all. The Plant-Wide Data Report (DD 1921-3) is primarily used as a point of departure for estimating future overhead. The PO analysts prefer this approach to relying solely on data supporting the forward pricing rate agreements (FPRAs), which they feel may not accurately reflect the future business base.

The PO analysts believe that one of the major hurdles in using CCDR data is to establish consistency across contractors and even across different contracts within a given contractor. They reported such efforts to be labor-intensive and time-consuming. They said in recent years, many contractors have been reclassifying some indirect costs to direct charges. For example, McDonnell Douglas Aerospace Corporation recently experienced a 27-percent increase in manufacturing hours as the result of reclassifying costs. The analysts warned that the cost analyst has to be aware of any such major changes in accounting data that may significantly affect the cost estimate.

CCDR Formats

The PO analysts noted that the CCDR pamphlet was generally adequate in providing guidance in report preparation. They felt the existing data elements were reasonable, presenting a common structure applicable to multiple contractors. The CCDR structure and definitions were better for aircraft systems than for missile systems.

The PO analysts' primary concerns were with the levels and frequency of CCDR reporting established and administered by the CAIG. They said the CAIG pushes strongly for level 3 WBS reporting and for semi-annual reporting on the 1921 and 1921-1 reports during research and development and the first several years of production. In contrast, the POs need more detailed cost data at less frequent intervals (annual submissions normally suffice). The PO analysts consider level 3 WBS data to be reasonable for generating macro-level estimates such as those prepared by the OSD CAIG but are not sufficient for PO cost estimating. They felt the POs should be given flexibility in determining detailed reporting requirements after satisfying a minimum reporting standard by OSD.

CCDR Processing

The cost-estimating branches have not developed any formal documentation for processing CCDRs within their organizations. They said the primary source of guidance for both the government and contractors is the CCDR pamphlet. They stated that validation of CCDR data is seldom performed primarily because of the general lack of cost-estimating resources and time and secondarily because of the perceived inadequacy/ irrelevance of the data. The PO analysts also were not aware of any CCDR system oversight by any organization, including the Administrative Contracting Officer (ACO), the DCAA, and the cost analysts participating in C/SCSC or Selected Acquisition Report (SAR) reviews.

They did not provide any specific contractor or government costs associated with CCDR system. However, they generally considered them to be insignificant, especially the recurring costs of producing automated 1921 and 1921-1 reports.

AIR FORCE[2]

The CCDR organizational responsibilities within the USAF reflect the general organizational responsibilities of the USAF acquisition system, i.e., centralized policy direction from the Air Force Secretariat [Deputy Assistant Secretary (Cost and Economics)] level, with decentralized administration and collection at the Air Force Materiel Command Program Office level.

As originally intended, the CCDRs were designed to provide actual cost data from current programs under development and/or production for use on estimating subsequent weapon systems. In general, however, the CCDRs do not have widespread usage by cost estimators within the USAF. This is due to several reasons.

---

2 The Air Force provided this introductory text after the meetings with Air Force cost centers were held.

First, the CCDRs are not viewed as providing data which is consistent, accurate, or applicable to specific cost estimating tasks, with the exception of perhaps higher level parametric models. This is due to a wide variety of reasons, the largest being incompatibility between/among different contractors.

Second, significant effort is not expended in analyzing the data after it is received from the contractors.

Third, the lack of a centralized, easily accessible DoD-wide database makes gathering of CCDR data a difficult task.

Fourth, there is a lack of formal training within DoD on the collection, analysis, and use of CCDR data to build cost estimates, perhaps because of the previous three reasons.

If the OSD requirement to develop CCDR Plans, have them approved, and have contractors collect data and provide it to program offices is to make economic sense, greater utility and availability of the data must be established. Otherwise, the USAF position is that, if the above problems cannot be eliminated, serious consideration should be given to eliminating the CCDR requirement and placing more emphasis by cost analysts on Contractor Performance Reporting and other estimating data sources.

Air Force Deputy Assistant Secretary, Cost and Economics Office, February 5 and April 19, 1993

Summary

The role of the Air Force Deputy Assistant Secretary, Cost and Economics Office (SAF/FMC) is policy, review, and oversight, not estimating; therefore, use of CCDR data is limited. Primary CCDR users would be at the AF Cost Analysis Agency and AF Materiel Command cost staffs and systems program directorates (SPDs). While SAF/FMCC analysts selectively use some CCDR data to build specific cost estimates, they do not routinely analyze the reports or use the data. SAF/FMC does not maintain a centralized database and has not developed any cost models or cost-estimating relationships (CERs) based on CCDR data. In the past, SAF/FMC coordination on CCDR Plans has been limited. SAF/FMC stated that the AF cost analysis community uses CCDRs in conjunction with other cost reporting data such as Cost Performance Reports (CPRs) and Contract Fund Status Reports (CFSRs). SAF/FMC realizes that variations in use can occur at the centers and program offices within AF Materiel Command.

Though there are problems, SAF/FMC is a strong proponent of the CCDR system to support a wide range of cost-estimating approaches from parametric to bottom-up

estimating. The usefulness of CCDRs could be improved significantly with increased management support and availability of additional resources to oversee and maintain the system. SAF/FMC noted the following specific problems in CCDR administration.

- lack of understanding and experience of many cost analysts and other acquisition personnel in the use and value of CCDR data,
- limited availability of data because CCDRs are not purchased on all programs and contract types,
- insufficient review (validation) of CCDRs at all levels,
- inconsistent cost data element reporting between WBSs and contractors,
- frequently inadequate level of reporting detail, and
- incompatibility of contractor internal accounting systems with CCDR formats.

SAF/FMC noted that the content of the CCDR is generally adequate. At a minimum "end of contract" reports should be required, but some annual reporting is also necessary to assist program offices who are not receiving full cost/schedule reporting. SAF/FMC strongly endorses the concept of a centralized database and recommends that database maintenance procedures include a centralized and recurring validation process.

Uses and Utility

SAF/FMC cited the lack of a well-disciplined system as the major factor that adversely affects CCDR usage and utility. There is no established CCDR infrastructure to ensure data reliability and accuracy at the SAF/FMC level. Failure to properly oversee and administer the CCDR system manifests itself in a variety of ways. CCDR Plans are reviewed by SAF/FMC before being sent to OD(PA&E). However, program offices do not always put CCDR requirements on contract. For example, at times, they exclude firm-fixed-price contracts from coverage. CCDR reporting is not consistently monitored at SAF/FMC to ensure receipt nor are reports reviewed to ensure reasonable accuracy. The policy is that the receiving SPD and/or product center should perform this task. "Policing" the system is left to the discretion of the SPD/product center who uses the data. In addition, CCDR reviews, when conducted, are largely performed by program office personnel. They are not typically reviewed at AFMC cost centers or AF headquarters levels to ensure consistency across contractors. The bottom line is that inconsistency in data, limited availability and uncertainty about data quality translate into limited utility. CCDR data for a contractor are often used for follow-on contracts with the same contractor.

SAF/FMC pointed out that there are two significant contributing factors to the limited use of CCDRs. First, there is a general shortage of cost-estimating resources that

can be corrected, at least in part, either by adding more people and/or increasing the priority of CCDR-related work. Second, there is a lack of knowledge, experience, and understanding of the l· ·erm benefits that the data can provide to the acquisition community in general e cost-estimating community in particular. SAF/FMC notes that the data can be effectively used in estimating costs of future contracts involving a specific program, analogous programs, and for CER development, and learning curves.

SAF/FMC believes that CCDR use would increase significantly if tri-Service data were made available easily and routinely to DoD cost estimators. A key feature of the automated database concept should involve some level of centralized validation to enhance accuracy and consistency. This process would supplement the more detailed analysis that must be performed by the responsible cost estimators below the OSD level who are likely to be more familiar with the specific program and contractor.

Report Formats

SAF/FMC recommended that contractor e required to provide explanations of major accounting changes that affect the way data (cost categories and cost elements) are reported. Such explanations should be included in the remarks section. SAF/FMC prefers using technical sources rather than the CCDR for obtaining technical data needed for cost estimating. SAF/FMC also noted that contractor data for fixed and variable cost analyses are dynamic (e.g., business base) and should be based on the most current information available from individual firms. Program offices typically use FPRA data because they are readily available and reflect current business conditions.

SAF/FMC indicated that the Functional Cost-Hour Report is the most widely used and valuable of the CCDR reports. On the other hand, the Plant-Wide Data Report (1921-3) is of little value at the HQ USAF level.

CCDR Processing

SAF/FMC has not established any firm policies and procedures for administering and overseeing the CCDR system. There is no overall system to ensure receipt and review of CCDR reports. CCDR Plans currently flow through PEO, through SAF/FMC for coordination, then to OSD. SAF/FMC does receive copies of CCDRs as an addressee as required by contract data requirements lists (CDRLs).

As previously noted, SAF/FMC considers quality of CCDR data critical to its potential value and use. SAF/FMC indicated that some benefits may be achieved by the increased involvement of the DCAA and closer integration with some of the C/SCSC

requirements. Finally, SAF/FMC could not provide any specific estimates for the contractor costs involved in CCDR reporting although the perception was that such costs were not significant.

Aeronautical Systems Center, February 24, 1993

Summary

The staff of the Aeronautical Systems Center (ASC) Financial Management Cost Division (FMC) does not routinely use CCDR data in its cost analysis work. Periodically, ASC/FMC uses the data selectively in generating program cost estimates. In addition, ASC/FMC recently surveyed system program offices (SPOs) to determine the accuracy and utility of the CCDR system. The results of the survey (reflecting 46 SPO responses) indicated that cost analysts do not consider the CCDR to be a reliable data source. The primary reasons CCDRs are not being fully used at ASC were differences in cost classification among contractors and a general inability to reconcile CCDRs with C/SCSC reports such as the CPR. Although ASC/FMC believes that the level of quality control being performed is probably not high, there are no supporting data available to specifically quantify CCDR quality efforts or results.

The CCDR utility issue was raised at a recent ASC/Industry Cost Workshop. The contractors generally agreed that the CCDR was lacking as a data source because of Military Standard 881-A definition problems, especially in recurring and nonrecurring costs, and the functional cost orientation of CCDRs despite current DoD direction to support product team requirements. The industry-recommended fixes included better Military Standard definitions, more flexible reporting to accommodate changing business accounting practices, and emphasis on the major subcontractor data.

Uses and Utility

The CCDR is periodically and selectively used within the ASC financial management community to obtain cost data in support of specific program estimates. Ordinarily, such data represent just one part of the overall estimate. In these cases, ASC uses CCDRs to obtain data to develop CERs, to update existing models, and for analogies when doing estimates. However, analyses of standard contractor cost reporting focus on the CPR and the Cost/Schedule Status Report (C/SSR). ASC/FMC has not established an automated CCDR database nor have they developed any CERs or models from the data that have been validated by the Air Force Cost Analysis Agency (AFCAA) or Air Force Materiel Command (AFMC) . Validation is required when a particular cost-estimating

methodology is being used to justify estimates to those higher-level organizations. Recent ASC/FMC surveys of program offices produced similar results.

Currently, usage of the CCDR is inhibited by several factors. First, program cost analysts generally are not familiar with the report contents. Analysts do not use them because they are not adequately trained to interpret and analyze CCDR data. This is partly caused by the lack of available formal CCDR training. ASC/FMC has attempted to remedy this situation by offering some internal CCDR training.

Second, there is a lack of confidence in CCDR accuracy and consistency. Quality control at both the ASC/FMC and SPO levels is limited. The extent of quality control varies by individual analyst and is dependent upon several variables, such as knowledge, experience, data availability, and workload priorities. ASC/FMC is in the process of formalizing CCDR reviews. A forthcoming internal regulation will give ASC/FMC responsibility for analyzing CCDRs received from contractors. This means ASC/FMC will work with the program offices to complete a quality review. ASC/FMC is also implementing a CDRL paragraph that will require the contractor to provide a reconciliation with C/SCSC products as part of the CCDR submittal.

Ultimately, the DoD goal is to establish a standard database to facilitate the collection of data and development of cost models and CERs. ASC/FMC supports the concept of a centralized and automated CCDR database that would be available to all DoD cost analysis organizations and program offices. However, inclusion of the CCDR reports from the contractor to the centralized database should not be made until the quality of the report has been verified.

Report Formats

The Plant-Wide Data Report (1921-3) is not being used in ASC's cost estimating and analysis. Analysts ordinarily use the overhead data and rates contained in the forward pricing rates provided by the DPRO.

ASC/FMC supports the need for all types of contracts and programs (both ACAT I and II) to be covered by CCDRs. In the case of firm-fixed-price contracts, ASC notes that it is essential that the CCDR contain the individual cost elements at actual cost rather than negotiated price. Accordingly, ASC/FMC suggests that profit could be included as a one-line entry that reflects the profit negotiated for instead of actual/expected profit.

ASC also noted that a narrative should accompany individual CCDR reports that explain in detail those cost categorization areas where cost assignment may not always be

clear. These explanations should help in establishing a consistent structure across contractors. The narrative should also include accounting practice changes, technical characteristics of the system, schedule, and significant program events occurring during the reporting period.

CCDR accuracy (and efficiency) could also be improved by integrating CCDR requirements with the C/SCSC system and, more specifically, with the CPR and the CSSR. The CCDR should be made part of the C/SCSC validation process. Such integration will improve reporting discipline, quality, and facilitate training when CCDR requirements are incorporated into already existing C/SCSC courses.

CCDR Processing

CCDR Plans are now routed by the SPO through ASC, AFMC, Program Executive Office (PEO), Directorate of Cost Analysis (SAF/FMC), and finally to the CAIG (for ACAT I). However, ASC notes that this is a relatively new procedure. CCDRs are forwarded directly to the SAF and DCAA from the contractor. ASC was not able to identify any DCAA involvement in the CCDR process.

The ASC cost of overseeing the current CCDR system is minimal. The implementation of formalized quality assurance can be absorbed using existing resources. The time spent in developing and maintaining a usable cost database should eventually facilitate the cost-estimating process and enhance accuracy.

Specific contractor costs for producing CCDR reports could not be determined as reporting costs are rolled up and priced and negotiated at the group level. However, ASC does not consider the CCDR-related contractor costs to be significant.

Air Force Cost Analysis Agency[3]

Summary

The following points summarize Air Force Cost Analysis Agency (AFCAA) opinion on CCDRs in the Air Force.

- *Implementation.* The Air Force cost community is presently a limited user of CCDRs, and does not actively manage the program to obtain maximum benefits from them.

---

[3] We did not meet with representatives of the Air Force Cost Analysis Agency; instead, these comments were provided for inclusion here. The summary is presented here in the same form as it was provided to us.

- *Cost Reporting Structure*. Optimum levels of detail and structure are not always placed on contract, and the various formats of the CCDR are not well-understood by program office cost analysts responsible for placing them on contract through negotiation with the contractor.
- *Submission*. There is little if any oversight of reports as they are submitted to the Air Force during the contract reporting period, and retention and filing of reports are haphazard.
- *CCDRs in the Estimating Process*. Use is very limited and retention of CCDR files for historical purposes is spotty. There is no automated basis for use of the data.

As a result of the above, the government has procured a lot of cost information, from which it is deriving very little benefit. However, the large amounts of data collected, on so many types of systems over a long period of time, could be extremely useful if properly managed and manipulated, both at the time of collection, and in subsequent database development and analysis.

Implementation Management

Because the entire CCDR program has not enjoyed a high profile in the acquisition community, the cost community has had both a very limited exposure to the information available and little opportunity to discover the usefulness of the information. We have not actively managed the implementation, collection, storage, and use of the data elements in the manner we have, for example, the C/SCSC. Yet the information is available from the very same cost accounting structure, and in many cases is on contract in companion Data Item Descriptions, making use of the same WBS. No one in the Air Force acquisition cost hierarchy from the product center staff to OSD PA&E takes responsibility for encouraging use of the data. Once the CDRL is approved by OSD, including the CCDR Plan, generally nothing more is done with them, except receipt from the contractor, and filing away.

Cost Reporting Structure

The CCDR formats are uniquely designed for each contract, normally by the program office financial analysts, sometimes with assistance from the product center cost staff. Because of a summary level of reporting, the fact that the requirement and approval for implementation come from OSD, and little expressed interest in reports once the contract is underway, CCDRs are little noted by the program office or their financial and program management support staff. Because no one expresses a serious interest or need for the information, and few understand the potential uses of the various data formats, the

resulting reports do little for future estimating needs. It is a true "chicken and egg" scenario. Lack of interest breeds poor reports, which breed lack of interest. There are legitimate reasons why the program office and product center staff have little need for CCDRs. Because the information provided is at relatively high levels of the WBS and functional structure of the contract, it adds little to what is given by the CPR, or the completely detailed program costs provided by contractor internal documents, the DPRO, and other sources. One valuable area is the breakout between nonrecurring and recurring costs and labor hour data. Also, since the format is fixed at contract inception and seldom changed, it may be unresponsive to the level or approach needed for a particular estimating task. As an example, the CCDR may include program management labor in with recurring flyaway costs, while the estimate at hand requires that management be broken out and estimated separately.

Submission

The lack of importance attached to administering CCDRs results in haphazard processing and storage of data. The program office will normally keep copies, but use them little. The product center staff will file them in a cost library or functional office file, the command and headquarters Air Force will not normally even see them, and only OSD PA&E will routinely capture all of the data.

CCDRs in the Estimating Process

The level of detail found in CCDRs means that much of AFCAA usage will be for higher level, generic estimates for which system specific data are limited. This means that for usefulness to headquarters estimators, or those looking across numerous weapon system cost files, the information must be captured in a comprehensive, automated, well-organized data set. The information must be relatable to technical and programmatic factors, able to be combined with other system data, such as by contractor, to obtain averages, and develop CERs, and be subject to manipulation and statistical analysis. Such a dynamic data base of CCDR information does not exist, except possibly at OD(PA&E), where it is not available to Service analysts. Potential users in the local product center are most likely to be source selection staffs, researchers, and others seeking more generic data for estimating relationships and parametric approaches, who cannot gain access to the more detailed internal documents. For AFCAA, availability of CCDRs can supplement contractor or program office data, or replace it in circumstances where more detail is not available. They can also provide a cross-check of generic information to compare with program specific

data. The present spotty availability of CCDR information at program offices and product center staff level is a hindrance to the timely preparation of our Component Cost Analyses.

Space and Missile Center, September 28, 1993

Summary

The Space and Missile Center (SMC) cost analysis organization does not directly use the CCDR system for cost estimating or cost analysis. While SMC ensures CCDR requirements are placed on contract, it does not validate or use any of the data. In addition, SMC's experience with POs indicates that they also are not using the data. SMC noted that the lack of CCDR use may be due to lack of knowledge and experience of the cost analysts. SMC emphasized the need for a CCDR education program to train cost analysts both on the content of the various reports and how the data can be used to estimate future costs.

SMC sees a natural integration between the CCDR system and the C/SCSC system. SMC recommends that guidance be established to ensure that field-level activities understand the relationships between CCDR reports and the CPR or C/SSR. The frequency of CCDR reporting could be reduced and made effective if tied to key programmatic events such as preliminary design review (PDR) and after first hardware unit is delivered. SMC also noted the WBS structure needs to be more flexible to accommodate PO needs. In estimating future costs, SMC uses overhead data from the forward pricing rate agreements rather than the Plant-Wide Data Report (1921-3). SMC did not propose any changes to the CCDR formats.

Uses and Utility

SMC does not use CCDR data at all. SMC views CCDR data as being primarily for OSD to develop and update cost models. SMC pointed out one potential indirect usage of CCDRs. Specifically, SMC uses the Unmanned Spacecraft Model as the primary model for estimating spacecraft costs. The data for the model are periodically collected by a support contractor who obtains cost data directly from the spacecraft contractors. The data are obtained in various formats at the discretion of the individual spacecraft contractor. At times, CCDRs are provided as the cost documents.

SMC noted that CCDR usage could be significantly enhanced through development and implementation of a DoD training program. The only training available now is provided on an ad hoc basis by people experienced in CCDR content and application. Many cost analysts do not know what the CCDR reports contain, how to review and validate the data,

nor how to use the data in cost estimating. Usage in POs might improve if more flexibility were provided the CWBS to allow for their unique needs.

SMC indicated that the utility of the CCDR system could also be improved by collecting data to support fixed and variable cost analysis. Such data would be particularly valuable in assessing the cost effects of a changing business base at a particular contractor.

Report Formats

The SMC cost analysis organization has recently changed from a functional to a product organization. A significant potential benefit is the increased integration of the various financial disciplines (i.e., cost estimating, C/SCSC analysis, and budgeting). SMC sees considerable similarity between the CCDR and CPR reports. The 1921 report could be expanded to incorporate a capability to report performance measurement information by WBS element by the recurring and nonrecurring breakout already required by the 1921 report. The functional breakout in Format 2 of the CPR should be compatible with the 1921-1 report. SMC believes the 1921-2 and the 1921-3 reports will remain largely intact.

SMC recommends that reporting frequency for CCDRs be aligned with major program events to make the data more meaningful and timely. Contract milestones such as preliminary design reviews, critical design reviews, and first hardware delivery are key points where CCDR data would be more relevant. SMC acknowledged the need for program data other than costs (e.g., physical, technical, and performance characteristics and other programmatics), but did not offer a specific recommendation on whether it should be made a part of CCDRs.

CCDR Processing

SMC does not have any written instructions for CCDR processing. SMC usually follows the guidance contained in the CCDR pamphlet, which is generally considered to be adequate (although it needs to be updated). The SMC cost analysis organization reviews all CCDR Plans and has not experienced any difficulty placing requirements on contract. If POs disagree with the requirement, they have to submit a waiver request, which goes through AF channels to OSD for action.

Currently, SMC maintains a library of all CCDR reports and annually inventories them but does not routinely follow-up to ensure receipt of missing reports. SMC could not provide an assessment of the quality of the reports because it does not review the data. SMC is not aware of any DCAA involvement in the CCDR process during the past 10 years.

SMC was unable to provide any estimate of costs being incurred by contractors to administer the CCDR system. The time SMC spends is minimal, involving only reviewing CCDR Plans, maintaining the library, and distributing the reports.

B-2 Program Office, February 23, 1993

Summary

For several years beginning in 1986, the B-2 Program Office routinely received CCDR reports. At the same time, the office had developed and was receiving its own Program Cost Reports (PCR) from Northrop. The PCR generally contains much of the same information as required in the CCDRs but with expanded detail and some changes in data requirements. About two years ago, the B-2 PO stopped CCDR reporting because it was not being used and was viewed largely as a duplicative requirement.

The PCR is an annual requirement and is used by the Program Control Office to estimate future program costs using actual and projected costs furnished by the contractors. The major subcontractors (Vought, Boeing, and Hughes) also report PCR data through Northrop. The PCR is prepared concurrently with the annual "grass roots" estimate at completion (EAC). From the perspective of the B-2 PO, program offices need cost data by type and level of detail that is essential for their own program cost analyses and management. The PO also recognizes the need for a general cost data framework to provide consistency in data across program contractors and for summary data that is reported to other organizations. However, it is also essential that the PO retain the flexibility to adapt reporting requirements to satisfy its own cost analysis needs.

Uses and Utility

The CCDRs were never used, while the PCRs have been used extensively in program cost estimating and budgeting. The PO maintains a hard-copy PCR file and uses the data in its cost model to develop relevant cost-estimating relationships. The recurring and nonrecurring breakout of both WBS and functional hours and costs are the most important feature of the PCR (and CCDR).

The B-2 PO and Northrop are now employing integrated product teams (IPTs) to improve program processes and management. IPTs are cross-functional groups and require different types of data than are currently available in existing accounting and reporting systems. The new acquisition environment, reflecting budget cuts and attendant downsizing, will likely emphasize prototyping and limited production quantities that focus more on engineering and manufacturing development (EMD) and less on the production

phases. Fixed and variable cost analysis takes on increasing importance in estimating the costs of smaller production buys.

Report Formats

The PO substituted overhead rates included as forward pricing data provided by the DPRO for rates and data provided on the Plant-Wide Data Report (1921-3). DPRO data were considered to be more current and accurate. At one time, the type data provided in the Progress Curve Report (1921-2) were viewed as the most useful. However, the B-2 has found the report less meaningful as touch labor decreases in importance as a cost driver and engineering complexity becomes increasingly significant.

The PCR does not contain any physical, technical, or performance characteristics. Requirements for such data are obtained separately from the technical people in the program office. Contracting personnel do not use PCR data. PCRs are ordinarily obtained on cost-plus and fixed-price contracts except for firm-fixed-price contracts. The B-2 PO stresses the need for understanding the data contained in the PCR. Subcontractors are a particular problem because they typically use different accounting systems and may have varying interpretations of reporting definitions and instructions. This may result in different accounting and reporting of costs. More specifically, the major problem in cost category determination was recurring versus nonrecurring costs. While the definitions of each category are straight forward, different interpretations by contractors result in different cost categorizations.

The B-2 PO also made two other general comments. First, the B-2 PO preferred to have software costs shown as a separate WBS element rather than as individual pieces of the related hardware WBS elements as prescribed by Military Standard 881. Second, the requirement for CCDR type data (either the CCDR itself or similar reports such as the PCR) could be integrated with the C/SCSC and CPR requirements to facilitate government oversight of contractor compliance and formal training of government personnel. Training courses are readily available for C/SCSC and related CPRs, while they are nonexistent for CCDRs.

CCDR Processing

The PO provides written PCR instructions to Northrop and the major subcontractors each year. The PO considers the PCR to be reliable. Northrop reconciles the PCR with the CPR. In addition, the PO cost analysts review the data for accuracy and reasonableness when developing their cost estimates. The DPRO performs contract

surveillance for the C/SCSC and the related CPR. However, the PO is not aware of any specific oversight of the CCDR system either by the DPRO or the DCAA. Interaction with the CAIG to date has primarily involved support for the development of independent cost estimates.

The cost of the PCR is not known since it is just one of many data reporting requirements that is priced and negotiated as part of a group. However, the PO does not view it as an expensive reporting requirement. PCRs normally are not distributed outside the program office. This same limited distribution also applied to CCDRs until they were terminated about two years ago. This was primarily due to the classified nature (until recently) of program cost data. Recently, the B-2 office has been cooperating directly with AX Program Office personnel who have been requesting cost data.

F-16 Program Office, February 23, 1993

Summary

The F-16 Program Office routinely receives CCDR reports on all contract types, including firm-fixed-price contracts. However, the reports are obtained solely to comply with OSD direction and are not used by the program office in any of its cost analysis work. The CCDR system is viewed as a research requirement for other organizations that need program cost information to complete their studies and analyses. The PO maintains hard copies of the CCDRs; there are no electronic files or automated databases. Ordinarily, no requests for CCDR data are made from other organizations.

F-16 cost analysts obtain necessary cost data to support their cost analyses and estimates directly from General Dynamics (GD). This is normally done in conjunction with the annual reviews conducted by program contracting personnel. Such cost data are typically more detailed and current compared to the CCDR data.

Uses and Utility

The F-16 PO did not identify any uses of the CCDR data for its own purposes. The primary value of the CCDR was as a source of research data to be used in developing models and cost-estimating relationships outside of the program office environment.

Report Formats

The PO recommended several potential improvement areas. First, it is preferable to use DPRO forward-pricing data reflecting overhead data and rates in generating program cost estimates. Such data are current, accurate, and equate to estimated contract costs for

overhead. Second, data regarding recurring and nonrecurring costs are important and must be understood across contractors. Third, data to assist in the analysis of fixed and variable overhead analysis would be useful. Presently, GD provides equations and supporting data to the PO to support fixed and variable analyses in response to changing quantities and the business base.

Fourth, a narrative summarizing technical performance and key issues during the period covered by the reports would be helpful. Fifth, it would be worthwhile to consider the feasibility of integrating CPR and CCDR requirements. This would also help fill the CCDR training void as CCDR information could be added easily to the already existing C/SCSC and related CPR courses. Sixth, data should be collected on all types of contracts, including firm-fixed-price and FMS and on both ACAT I and ACAT II programs.

CCDR Processing

The only CCDR guidance available is the joint-Services CCDR pamphlet; no additional instructions have been prepared. The CCDR Plan is reviewed by the cost staff at the Aeronautical Systems Center (ASC) and forwarded to the CAIG through the AFMC and PEO channels. The PO does not perform any quality review of the CCDR. Quality assurance work apparently is limited to the tasks outlined in the memorandum of agreement (MOA) between the PO and the DPRO. The MOA requires the DPRO, in conjunction with the DCAA, to reconcile the Contract Funds Status Report (CFSR), the CCDR and the CPR on an annual basis.

The PO does not expend much time in CCDR processing. The cost for contractor processing cannot be readily determined because costs are rolled up and priced as a group of data reporting requirements. It is not viewed as an expensive requirement. The PO generally supported the concept of a centralized DoD electronic database that would be accessible to all Services, cost organizations, and program offices. However, given the proprietary nature of the data, contractors may have reservations because the opportunity for data proliferation increases dramatically.

DEFENSE AGENCY

Ballistic Missile Defense Organization, October 20, 1993

Summary

The Ballistic Missile Defense Organization (BMDO) generally supports the concept of the CCDR system as one component in the overall data-collection process. However,

BMDO representatives pointed out that the existing processes and resulting cost databases have many shortcomings, such as:

- Cost databases, including the CCDR often do not contain current data; the most recent data frequently are at least several years old.
- Cost data are not validated for accuracy and consistency.
- Cost databases such as the CCDR typically do not reflect current development and manufacturing technologies.
- Cost databases typically do not provide information on system programmatics that may help explain system costs.
- The formats of cost reporting systems have not kept pace with what is needed by cost analysts when performing and presenting cost estimates.

BMDO noted these difficulties can only be partially overcome at best due to limited cost analysis resources. The marginal benefit that would be derived from redirecting existing resources to improve cost data may not be worth the effort. BMDO also provided the following comments about the CCDR system:

- BMDO suggests that report formats be based on the CAIG presentation requirements contained in DoD 5000.4-M.
- CCDRs are most valuable at the end of a contract or acquisition phase, when total costs are available. Interim reporting is not very useful because it represents partial information only on actual incurred costs.
- BMDO has been involved in many cost presentations to the CAIG and noted that the status of CCDR reporting was neither required nor discussed.
- BMDO supported the concept of an automated database but was quick to point out that the utility of the system would still be constrained by the quality and timeliness of the data being maintained.
- BMDO could not identify the costs associated with the CCDR system although representatives thought the government portion was small.

Uses and Utility

Cost estimators routinely need reliable, actual cost data to develop cost models, CERs and even for doing bottoms-up analyses. Analysts will use the best data available to support the cost-estimating process. Data collection is frequently performed on an ad hoc basis. It is often difficult and time-consuming to collect data from contractors for a variety of reasons, including the bureaucratic approval process for the release of data on the part of both contractors and DoD. If CCDRs are available and the quality of their content has been or can be verified, analysts will use them. Ordinarily though, CCDR data are of

questionable accuracy, have not been verified, and can be difficult to obtain on other programs.

The data contained in CCDR formats are not easily mapped to the cost presentation requirements of the CAIG (DoD Directive 5000.4). CCDR data must be mapped into that structure. CCDRs do not capture all relevant costs such as government-furnished equipment and services. Because CCDRs are historical representations, they may not reflect current trends and technologies. BMDO noted that most of its cost models and CERs are based on data from the early 1970s to the mid 1980s and represent obsolete production technologies. In addition, there is usually no information on programmatics (e.g., performance and technical characteristics, acquisition strategy, unique problems, etc.) to help explain the cost data. BMDO observed that for recent major programs, the CARD has filled this void. The CARD or a similar type document would be a valuable addition to the CCDR system. It also would be worthwhile to compare the CARD with actual CCDR data each time the CARD is updated.

BMDO has found that the Progress Curve Report (1921-2) is the most useful CCDR format. BMDO uses the recurring unit cost data to help prepare estimated learning curve slopes. BMDO pointed out that the majority of its estimates represent independent analyses of Service program office estimates. In this context, BMDO deals with total costs by WBS element and does not generally try to separately track and forecast direct and indirect/overhead costs. BMDO views future overhead costs as being particularly difficult to project.

CCDR Formats

BMDO recommended three specific improvements to the CCDR formats. First, formats should be adjusted to satisfy the CAIG presentation requirements contained in DoD Directive 5000.4. While there needs to be consistency in the data collected, there also should be consistency in presentation requirements to facilitate reporting. As a result, a typical database has two sets of data, the raw data collected and the reformatted data needed to support cost analysis. This reformatting requires the use of "bridges" or "mapping" to transfer from one data structure to the other.

Second, interim CCDR reporting (e.g., semiannually or annually) over the life of the contract is of little value other than to do an accuracy and consistency check (which usually isn't being done anyway). Cost data provided in "bits and pieces" generally can not be used effectively in estimating future costs. The important data comes at contract

completion, which for research and development generally coincides with the appropriate acquisition phase, typically the most meaningful event.

Third, BMDO felt that the CCDR pamphlet was generally adequate in describing reporting requirements but needed to be updated.

CCDR Processing

The majority of tasks associated with the receipt and use of CCDRs in BMDO is performed by support contractors. There is no formal documentation or system for internally validating the data. In addition, BMDO was not aware of any DPRO or DCAA activity in reviewing the CCDR system.

BMDO was unable to provide any specific data on the costs to administer the CCDR system either from a DoD or contractor perspective. They did note, however, that government costs are minimal primarily due to the general lack of CCDR management, control, and validation. BMDO noted that most contractor personnel involved in CCDR administration were indirect employees whose time was not accounted for at the detailed reporting system level.

CONTRACTORS

General Electric (Cincinnati), February 25, 1993

Summary

General Eletric (GE) personnel strongly recommend that the CCDR system be eliminated because they view the output data as being a non-value-added cost reporting burden. The only time GE reviews and uses CCDRs within the plant is in response to DoD solicitations. Subsequent CCDR reporting is made solely to satisfy contract requirements and undergoes little if any quality review. Current report formats are cumbersome and generally require detailed mapping from internal accounting records and reports. GE notes that the reporting of actual costs is much less burdensome and costly than projecting future costs.

GE personnel contend that DoD is not now using CCDR data, that such data are not being distributed within the government to all intended users, that the data may not be highly accurate, and that current formats are not meaningful. Even if major deficiencies are corrected, GE doubts that DoD would make extensive use of the reports. The specific cost of the CCDR reporting system could not be determined because it is not separately

accounted for and priced. However, the cost, while not being significant enough to measure, is still an unnecessary extra administrative burden.

Uses and Utility

GE does not use the CCDR reports for any purpose other than satisfying contractual requirements and responding to government solicitations. After the contract has been awarded, GE does not use the reports to analyze current costs or estimate future costs. GE points out that the new ways of doing business integrate many of the manufacturing and engineering functions that may make historical data less relevant.

GE maintains hard-copy files but has not developed an automated database. The reports are typically prepared on electronic spreadsheets that may or may not be forwarded with the hard copies to the government.

Although GE personnel generally consider the CCDR system to be of little value, the perception of individual reports varies. The Plant-wide Data Report (1921-3) and the Functional Cost-Hour Report (1921-1) are considered to be the least useful. The Progress Curve Report (1921-2) may be helpful after production begins but data reported during early development may not be very accurate or useful. The Cost Data Summary Report (1921) is probably the least onerous and contains the most relevant and accurate data.

The utility of CCDR data at the more detailed levels (below the third level of the contract WBS) is even more suspect. Such detailed data are generally more cumbersome and time-consuming to prepare and often reflect a unique condition that is not directly applicable to other programs.

GE notes the importance of fixed and variable cost analysis but does not believe that the distinction can easily be made for reporting purposes. Throughout the company, the concept of fixed and variable means different things to different people. For example, the CEO at GE views all costs as being variable while lower levels may at times have conflicting and varying viewpoints depending on circumstances, including the time frame under consideration. Recurring versus nonrecurring costs can also be a problem. Typically, the individual primarily responsible for preparing the report(s) makes the decision. Different individuals may make different decisions. CCDRs that are prepared in response to solicitations are usually the only reports that are reviewed internally. Subsequent CCDR submissions ordinarily are not reviewed, a practice that makes the recurring and nonrecurring breakout more the subject of individual interpretation.

Report Formats

GE personnel consider the data elements within each report to be self-explanatory. GE does not use government instructions for data element descriptions nor has GE developed any of its own. GE initiated an activity-based costing project about four years ago but terminated it because of extensive detail, excessive cost to administer, and limited value.

GE sees Cost Data Summary Report as the easiest report to prepare and the Functional Cost-Hour Report as the most difficult to prepare, particularly below level three of the contract WBS. Extensive work is required to map company accounting data for both functional and overhead data to the CCDR formats. Actual costs are much easier to report than projected costs, especially as the level of detail increases.

If CCDRs are required on firm-fixed-price contracts, GE indicates that it will not show actual profit separately. Actual profit, GE-negotiated profit percentages, and government-negotiated profit percentages are all subjective and will never agree.

CCDR Processing

GE divides CCDR reporting responsibility between accounting and/or financial personnel assigned at the plant level and those assigned to specific projects. Contractor accounting personnel prepare reports involving multiple projects, for example, the Plant-wide Data Report (1921-3). Project personnel prepare all other CCDR reports (1921, 1921-1, and 1921-2). All time spent on CCDR preparation is accounted for as indirect.

GE typically does not perform any internal quality review of the CCDR subsequent to contract award. Reports are monitored only for the timeliness requirements specified in the contract. GE is not aware of any specific quality reviews that are performed by the DPRO or the DCAA. Questions about the content of the CCDRs usually originate from individual cost analysts who may be using the reports (e.g., NAVAIR cost analysts).

On one particular program (F-414 engine program for both the F-18E/F aircraft types), GE estimated that it takes about four work days to prepare the 1921 and 1921-1 reports. GE noted that the time expended varies by program, depending upon complexity and the level of detail required. However, GE does not believe costs will be significant on other projects as well. The overhead report takes about six weeks for one person performing the task part time (about half time). These durations are estimates because hours are charged as indirect and not accumulated on an hourly time accounting system, as is the case for direct labor.

GE recommends that CCDRs be eliminated at least in their current formats and frequency. An alternative would be to do a "data dump" of all cost and related data at the end of the contract. The data would be reported in the contractor's format(s) that would then have to be converted to DoD formats by government personnel.

GE generally does not have a problem with the concept of an automated database maintained by OSD that is accessible to a wide audience of government cost analysis organizations. GE notes that because of the proprietary nature of the data, policies and procedures to control dissemination must be strictly enforced, which, in turn, creates an additional administrative bureaucracy.

Lockheed Fort Worth Company, September 14, 1993

Summary

Lockheed Fort Worth Company (LFWC) personnel do not use the CCDR system for any internal purposes. The reports are prepared only to satisfy contractual requirements. LFWC expressed no objections to the CCDR requirements, but questioned whether the reports were ever used by DoD given the almost total absence of questions during the past several years.

LFWC has developed and implemented written procedures to prepare the reports and considers them to be reasonably accurate. LFWC provided rough order of magnitude (ROM) man-hour estimates to prepare each of the four CCDR reports, and we priced the estimates based upon our experience with other companies. This resulted in the following estimated preparation costs based on annual submissions: $2,025 for the Cost Data Summary Report (1921), $2,700 for the Functional Cost-Hour Report (1921-1), $16,200 for the Progress Curve Report (1921-2), and $2,565 for the Plant-Wide Data Report (1921-3). LFWC noted that these estimates did not explicitly include computer costs (no estimates were available), which can be a significant portion of total preparation costs. The 1921-2 report is the most costly because it is manually driven while the 1921 and 1921-1 are 100 percent automated and the 1921-3 is about 50 percent automated.

Uses and Utility

CCDRs are viewed as a unique government requirement. LFWC expressed no objection to providing the reports and considers the level of detail requested to be reasonable. LFWC does not need or use any of the CCDR reports because they have no internal value. LFWC uses the same financial systems that produce the CCDRs but uses different data and formats to satisfy management needs.

LFWC understands the potential use of CCDR data to DoD in cost estimating but has not observed any such usage. The absence of questions about the CCDR reports from the F-16 SPO and the DPRO indicates that DoD may not be reviewing the data. LFWC noted that each year the SPO requests a special cost study, which it uses for cost estimating and program budgeting.

The apparent lack of DoD interest in CCDRs is also seen in the lack of audit activity by the DCAA. LFWC noted that the last DCAA audit occurred around 1984. LFWC questioned the need for annual reporting and recommended less frequent reporting, such as at the end of a contract or, alternatively, beginning, middle, and end of the contract.

LFWC is now using the IPT approach to manage selected programs. Data needed by the teams are frequently not available from existing accounting and reporting systems. LFWC does special reporting to satisfy the IPT requirement.

LFWC did not object to CCDR data being placed in a centralized, automated database provided strict proprietary controls are implemented.

CCDR Formats

LFWC suggested that the 1921 and 1921-1 reports could be combined with the CPR. The requirement to break out recurring and nonrecurring costs (not done in CPRs) for the 1921 report is not a problem for LFWC's reporting. When 95 percent or more of the effort can be classified as either recurring or nonrecurring, costs are not broken out. For its research and development contracts, LFWC reports all costs as nonrecurring. For production contracts, all costs are reported as recurring.

LFWC has not encountered any problems conforming to the WBS requirements specified in Military Standard 881. At times, government personnel make off-line requests for software cost data rather than trying to use the standard WBS reporting. LFWC generally considers the CCDR pamphlet to be an adequate source of guidance but noted that it needs updating. Periodically, LFWC has had difficulty categorizing some costs because of the inadequacy of pamphlet definitions.

CCDR Processing

LFWC uses its automated C/SCSC system to prepare the 1921, the 1921-1, and the direct cost portion of the 1921-3 report. The indirect portion of the 1921-3 is manually prepared based on a mapping of cost elements from the automated system. The 1921-2 report is manually prepared (95 percent). LFWC has developed written instructions on report preparation to supplement contract requirements and the CCDR pamphlet.

LFWC does not bid and negotiate the CCDR system as a separate CDRL item. Currently, all personnel performing CCDR tasks charge their time as indirect. However, LFWC developed rough order of magnitude man-hour estimates for each the four CCDR reports they prepare as shown in Table A-1.

Table A-1. Estimated CCDR Cost

DD Form	LFWC Hours	IDA Estimated Rate	Estimated Cost
1921	30	$67.50	$2,025
1921-1	40	$67.50	$2,700
1921-2	240	$67.50	$16,200
1921-3	38	$67.50	$2,565
Total	348	$67.50	$23,490

Note: Estimates exclude associated computer costs, which LFWC states could represent a significant portion of CCDR preparation costs. However, LFWC was unable to provide any specific cost estimates.

The estimates are predicated on an annual requirement for each of the reports. Note that Lockheed provided a combined 70 hours for the 1921 and 1921-1 reports. We arbitrarily broke out the hours assuming that the 1921-1 report requires more hours because there are many more of them in the typical CCDR data set. We estimated that a fully loaded man-hour rate would be approximately $67.50. This rate was predicated by considering the above hours as direct labor and applying an average overhead charge (including fringes and G&A) based on our experience with other companies.

LFWC believes its internal procedures result in CCDRs that are accurate and consistent even without any government reviews. During the last fourteen years, LFWC noted there were only two DCAA audits, the last one occurring in the 1984-1985 time frame.

Lockheed Aeronautical Systems Company, August 12, 1993

Summary

Lockheed Aeronautical Systems Company (LASC) personnel do not use any of the CCDR reports for any internal company purposes and consider them to be non-value added. LASC produces the CCDRs only in response to DoD requirements. Given the general absence of questions from DoD customers, LASC believes that DoD is generally not reviewing or using CCDR data.

DoD could enhance the utility of the CCDR system by providing additional flexibility to program offices to include tailoring the CWBS to program-unique

requirements. Currently, the F-22 program employs two different WBS standards, one for CCDRs that conforms to Military Standard 881 and another that is used for company operations and management. LASC recommended that further consideration be given to modifying selected Cost/Schedule Control System Criteria (C/SCSC) reports to include needed CCDR data.

The F-22 project office within LASC estimated the total cost of CCDR preparation (based on an annual reporting requirement) to be between $3,700 and $6,250 for each Cost Data Summary Report (1921), Functional Cost Hour Report (1921-1), and Progress Curve Report (1921-2).

Uses and Utility

CCDR reports are not used within LASC to track, control, manage, or estimate future program costs. The accounting system that accumulates data for CCDRs produces other data in a more usable structure and format to accommodate these purposes. LASC recommends that the CCDR reports be tailored to program needs. The data should be structured in the same way that will be used to estimate future costs. The DoD need for and use of CCDR data is suspect. LASC points out that DoD seldom questions the reports and does not always require CCDR reporting on all programs.

The WBS structure used for the F-22 CCDRs is not used for any other purposes and its ongoing maintenance is considered to be non-value added. LASC has a tailored WBS that is used for management, control, and cost estimating. LASC noted that the data requested for CCDRs is often at level 4 of the WBS structure, which is considered to be more detailed than necessary. LASC does not use the Plant-Wide Data Report (1921-3). In estimating out-year indirect costs, LASC relies on the overhead rates established in the forward-pricing-rate agreements.

LASC employs integrated product teams (IPTs) to manage the F-22 program. Some government organizations and contractors have expressed concern over the ability of traditional accounting systems and standard reports (e.g., CCDRs) to provide needed financial data to support the IPT approach. This is not a problem at LASC, which has used its current accounting and reporting systems to produce relevant cost data with the right structure and format needed by the IPTs.

LASC does not object to a centralized, automated CCDR database, provided DoD implements reasonable restrictions on access to protect contractor proprietary data.

Report Formats

LASC personnel see much similarity between the data collected for the CCDR and C/SCSC systems. For example, the 1921 and 1921-1 reports contain many of the same data elements found in the CPR. LASC suggests that CCDR requirements may be accommodated by periodic additions (e.g., annually add the recurring and nonrecurring breakout) to the CPR. The potential for selectively integrating requirements of the two systems warrant additional study.

LASC noted one specific problem with a data element on the 1921-1 report. Line 26, Other Costs Not Shown Elsewhere, is often significantly greater than many other individual data elements that typically would be expected to be higher. This may result, in part, from inadequate data element descriptions that have not kept pace with the changing acquisition environment.

CCDR Processing

LASC uses its automated accounting systems to produce the 1921 and 1921-1 reports. The 1921-2 and 1921-3 reports are prepared manually based on data from the automated accounting system. LASC does not have any formal written procedures for CCDR processing. It relies on contract requirements, C/SCSC instructions, and the CCDR pamphlet for guidance. LASC noted that DoD guidance is generally adequate but the twenty-year-old pamphlet needs updating to more accurately reflect the current acquisition environment.

LASC does not bid and negotiate CCDRs as a separate contract data requirements list (CDRL) item. However, the F-22 project office developed cost estimates for the CCDR reports it prepares. Costs include all resources used in CCDR processing and would approximate the estimated costs if CCDRs were separately priced. LASC provided estimates based upon an annual reporting for each of the report formats. The 1921, 1921-1, and the 1921-2 cost between $3,700. and $6,250 per year. The 1921 and 1921-1 reporting requirements begin one year after contract inception, while the 1921-2 requirement begins at first aircraft delivery. No estimates were provided for the 1921-3, which is centrally prepared by the accounting department. LASC indicated that personnel involved in preparing CCDRs are classified as General and Administrative (G&A) charges.

LASC considers CCDRs to be of high quality despite the absence of government reviews. LASC routinely reconciles CCDRs with the related CPR. LASC has not observed any DCAA involvement in the CCDR process, but noted DCAA's active role in the C/SCSC system to include specific audits of CPRs. The DoD program office typically does

not review or use any of the CCDRs. After our meeting, LASC was informed that DCAA intends to begin a review of recently submitted 1921 and 1921-1 reports. DCAA indicated this would be part of a routine review of contractually required reports generated by the C/SCSC system.

McDonnell Douglas Aerospace—East, May 19, 1993

Summary

The only use of the CCDR formats by McDonnell Douglas Aerospace-East (MDA) is to satisfy DoD contractual requirements. MDA understands the potential use and value of CCDR data for DoD cost analysts to estimate recurring production costs only. It considers CCDR data to be of very limited value in the nonrecurring area. While MDA readily acknowledged possible CCDR utility, MDA's experience indicates that DoD generally is not using the data. Program offices and other DoD cost analysis organizations ordinarily do not question MDA about the data.

MDA has written policies and procedures for CCDR preparation and routinely performs quality reviews before submission to DoD. As a result, MDA was confident that the reports are accurate. The guidance contained in the CCDR pamphlet is also considered to be generally adequate. The Cost Data Summary Report (1921) and the Functional Cost-Hour Report (1921-1) are prepared using an automated system, while the Progress Curve Report (1921-2) and the Plant-Wide Data Report (1921-3) are manually prepared.

MDA did not provide any specific estimates on how much the CCDR system costs to operate although such costs were described as being significant. The principal cost driver is the required level of reporting detail. All cost data must be segregated at the lowest level of detail specified for any one reporting element, a level that is at times lower than the detail established for MDA internal management and reporting purposes. These situations are most often seen with new programs and those having integrated logistics support and spares requirements, and they result in imposing level 5 and level 6 reporting. MDA stated that the cost of reporting could also be reduced by eliminating all interim reporting, instead requiring reports only at the end of the contract. MDA does not believe that periodic reporting and validation prior to contract completion are essential to ensure data integrity.

MDA is concerned over the development of an automated and centralized DoD database for two reasons. First, data may be misused by people who do not understand how the reports were prepared. Second, the risk of unauthorized dissemination of the data increases significantly. In assessing the data requirements for fixed and variable cost

analyses, MDA prefers that data be collected on an ad hoc basis to reflect the most current conditions. Classification of costs into fixed and variable categories is a dynamic process that changes with time.

Uses and Utility

During the last several years, MDA noted only one DoD program that was regularly using CCDR data. MDA recommends that CCDR data be limited to recurring production costs to include recurring prototype costs during the research and development phase. In addition, reporting should be limited to level 3 except when very unusual circumstances warrant further breakout.

MDA pointed out that the use and value of the data depend on the consistency and accuracy of the detailed cost element reporting. Major changes in accounting necessitate data adjustments over time. MDA also noted that a study team is considering the possible development and implementation of activity-based costing (ABC), a concept that would have a very significant accounting and reporting impact.

CCDR Formats

MDA generally did not have any problems with the specific formats and believed that the CCDR pamphlet provided adequate guidance. However, MDA felt that understanding of the data could be enhanced by summarizing major accounting changes in the remarks section.

MDA also objected to instructions pertaining to some specific WBS elements such as landing gear and windshields. Specifically, the pamphlet mandates that landing gear be included as Purchased Equipment even when manufactured in the prime contractor's plant. Such handling is misleading in both cost classification and in accuracy because it does not capture all the comparable costs associated with outside purchases such as G&A and profit. Conversely, MDA notes that costs for windshields purchased from external sources must be converted to a functional breakout as if those items were actually produced in the plant.

CCDR Processing

MDA has developed CCDR processing procedures although they are largely related to the guidance specified in the CCDR pamphlet. Hard copies of CCDR reports are routinely provided to DoD program offices, cost analysis organizations, and OSD as specified in the contract. Reports in electronic form are provided for the F/A-18 program only. The DPRO and DCAA are generally not involved directly with the CCDR system.

Their focus is usually on actual costs to date and the estimates at completion (EACs) that are used in the billing and payment process and more closely related to the C/SCSC system.

MDA did not provide any CCDR cost estimates. MDA does not separately estimate CCDR costs on contract proposals. Business type personnel that are assigned to a specific program office are a mix of indirect and direct charged to the program. Financial personnel assigned to the plant level are charged as indirect. MDA states that they can reasonably estimate time spent on recurring report preparation time but not for the nonrecurring activities that establish the detailed cost segregation and ultimate mapping to the CCDR.

Northrop Aircraft Division, September 29, 1993

Summary

Northrop Aircraft Division (NAD) does not use the CCDR system for any internal purposes. For internal management, NAD emphasizes a process rather than a WBS orientation. NAD produces CCDR data only to satisfy DoD contractual requirements. NAD contends that the utility of the historical cost data is minimal largely because of significant changes in aircraft technologies such as the widespread use of composite structures. NAD further questioned whether its DoD customers ever use CCDR data in their current format because questions or comments are rarely received.

A major problem with the CCDR system occurs when there is a requirement for a subcontractor to submit CCDR data to the prime. Subcontractors are often unwilling to provide detailed cost data that results in the prime having to estimate the detailed breakdown. NAD supports selectively combining the CCDR with the CPR produced from the C/SCSC. NAD also believes reporting frequency can be reduced and made more effective by relating CCDR reporting to specific major program events e.g. first and last hardware delivery. NAD also recommends using forward pricing rate agreement data rather than the Plant-Wide Data Report (DD 1921-3) to estimate future costs.

NAD indicated that cost reporting guidance could be significantly improved by combining C/SCSC and CCDR instructions to include making compatible data elements. NAD had no objections to a centralized, automated database for CCDRs, provided strict proprietary controls are implemented. NAD estimated that the cost of each complete CCDR submittal ranges between $100,000 and $150,000. If the Cost Data Summary Report (1921) and the Functional Cost-Hour Report (DD 1921-1) were combined with the CPR, NAD estimates a recurring cost savings of about one-third.

Uses and Utility

NAD does not use CCDR data. Management is process-oriented (not WBS-oriented) and focuses on cost center performance. However, NAD recognizes the potential utility of some of the data for DoD cost analysis and estimating while noting its limitations. Major changes in aircraft technologies and in the general acquisition environment over the past several years (especially in the current downsizing phase) severely limit the relevance and value of the data. The use of CCDR data by DoD is between limited to nonexistent. During the mid-1980s, NAD observed that there was no contractual requirement to submit CCDRs. Even when there was a requirement, customers seldom questioned the accuracy or classification of the data. NAD usually received comments only when parts of the reports had not been completed (e.g., early in the program when selected costs may not have been incurred yet).

NAD noted that the utility of the data can also be hindered by the reporting relationships that exist between the prime and major subcontractors. In cases where the DoD customer requires subcontractors to submit CCDRs through the prime contractor, the subcontractor is reluctant to provide detailed data. The subcontractors contractual relationship with the prime (e.g., fixed-price contract) or potential for future competitive position inhibits full cost disclosure. NAD has not experienced any difficulty when DoD requires direct submission from the subcontractor to the DoD. NAD also pointed out that each contractor has different ways of accounting and reporting. It is incumbent upon the prime contractor and DoD to understand the rules and assumptions behind the data.

NAD indicated that the 1921-3 report was of limited utility because overhead rates are changing significantly and rapidly as the business base declines. FPRAs represent the most current overhead data available, to include the forecasted business base and capital budgets, and are changing frequently in the current environment. NAD indicated that the primary allocation basis for overhead costs is still touch labor. NAD observed that touch labor in aircraft manufacturing may not have declined as significantly as some have estimated. In recent years, primes have been subcontracting out more work, which is accounted and reported as part of material costs. NAD has conducted some activity-based costing (ABC) pilot projects but has not made any firm decision about its future implementation.

CCDR Formats

NAD favored the merging of the 1921 and 1921-1 reports with the CPR. The NAD accounting system is designed to support the C/SCSC, which also produces the 1921 and

1921-1 reports. The present NAD accounting system also includes the recurring and nonrecurring breakout.

NAD recommended reducing reporting frequency by relating reports to significant program events. For example, the first report could be tied to first delivery during development. A second and final report should be provided at delivery of the last vehicle during engineering and manufacturing development (EMD). This frequency pattern is particularly useful for the Progress Curve Report (DD 1921-2) and avoids the problems with significant variations in learning curves as the costs of the first few development sets tend to fluctuate dramatically.

NAD noted that while the CCDR pamphlet is generally adequate in providing the general CCDR structure, substantial improvements could be made in preparing and understanding the report. First, NAD suggested that the instructions for both the C/SCSC reports and the CCDR be integrated into the DoD 5000 series of documents. Second, instructions should describe how to prepare and how to read each of the report formats. Third, data element descriptions for each of the systems should be the same or at least compatible with each other. For example, the functional elements in the CPR Format 2 should also satisfy CCDR reporting needs or, at least, map easily to the desired CCDR level of aggregation.

CCDR Processing

NAD has not developed formal operating instructions to administer the CCDR system and routinely follows the guidance contained in the contract data item description (DID) and the CCDR pamphlet. NAD believes that the CCDRs are very accurate and represent the best data available at the time of preparation. NAD was not aware of any DCAA or DPRO involvement in CCDR reviews. DoD program office involvement generally has been limited to preparation and coordination of CCDR Plans and distribution of the CCDR Reports.

NAD provided rough estimates on the cost of CCDR preparation. Each CCDR submission (all reports) consumes between 10 and 15 man-months at an average cost of $10,000 per man-month (fully burdened). This results in an average cost per submission of $100,000 to $150,000. NAD projected that combining the 1921 and 1921-1 reports with the CPR could achieve between $33,000 and $50,000 (one-third) in savings.

Pratt & Whitney, March 18, 1993

Summary

Pratt & Whitney (P&W) personnel consider the CCDR system to be a non-value-added activity that should be eliminated or at least modified significantly. The data are not used internally for cost analyses or estimating in the present environment of traditional cost accounting. The potential value of the current CCDR system will even further diminish as P&W develops and implements its proposed advanced accounting system.

P&W has decided to implement activity-based management (ABM) as a *replacement* system for its traditional cost accounting system in its *manufacturing operations*. The focus will be on process costs reflecting the various activities the organization is performing to produce output and satisfy customer needs. The conventional systems approach that collects costs by job order, organization (e.g., department) and type of resource (cost element) will largely remain intact for the company's research and development efforts. P&W recommends that contractor cost reporting requirements be modified to reflect company operations and related accounting system(s).

As the result of the accounting changes, P&W notes that existing cost databases reflecting traditional accounting structure (e.g., material, labor, and overhead, direct and indirect costs) and costs will be of limited value below the total cost level for an end item. P&W recommends using performance characteristics as the principal cost driver for cost-estimating purposes. Historical cost databases can still be used at the end item level for estimating costs of future systems provided key performance attributes can be related to the databases.

P&W acknowledges that fixed and variable cost behavior in response to changing quantities will still be relevant in the ABM framework and may be gaining increasing importance as defense business changes. Data to support such analyses (e.g., business base, capital asset values, etc.) are still relevant. Such data can and should be obtained from such government sources as the DPRO or the DCAA rather than from the contractor. Finally, P&W does not specifically account for CCDR system costs but generally does not consider them to be significant.

Uses and Utility

P&W uses the CCDR reports only to satisfy government contractual and solicitation requirements. P&W does not use the CCDR system for cost analyses or estimating and accordingly has not developed any CCDR databases, cost models, or cost-estimating

relationships. P&W questions the utility to the government and further notes that historical CCDR cost data collected will have limited value below the end-item level after ABM is implemented sometime in the 1994-5 time frame.

ABM represents a methodology for assigning costs first to business processes and then assigning business process costs to "objects" such as products, services, customers, and segments. ABM is designed to show the total and most accurate cost of economic resources that are being used by the cost object. Emphasis is on how output is being created rather than by traditional accounting for costs by the organization that consumes the resource and the specific type of resource being used (e.g., office supplies).

P&W has elected to use ABC as its primary accounting system for manufacturing operations because such work largely involves recurring activities. In contrast, research and development efforts primarily include nonrecurring activities that are more amenable to conventional accounting procedures. Such systems record costs at the performing organizational level and type of resource being used (cost element) by specific job number (e.g., an individual contract). P&W is closely coordinating its ABM efforts with the local DCAA.

While many companies throughout the manufacturing and service sectors have already implemented ABC, P&W's planned application departs from the typical scenario in two ways. First, P&W is replacing its ongoing traditional system with ABC. Most firms use ABM on a periodic basis (e.g., annually or semiannually) *in addition* to their standard accounting system. Second, P&W is reorganizing its operations from a functional department to a process orientation. Most firms involved in a continuous improvement environment (e.g., total quality management) use multi-functional teams that cut across departmental boundaries (e.g., integrated product teams) to implement change. However, the organization and personnel retain their functional department ties.

P&W prefers the use of performance characteristics (e.g., time and speed) in estimating program costs instead of physical attributes (e.g., weight and size) and other cost-related elements (e.g., direct labor costs and hours). Time measurement (e.g., computer speed and cycle time) is critical in assessing the cost effect of many of the new technologies. Historical cost databases such as the CCDR must incorporate performance measurements to make them relevant for estimating new systems. Detailed cost breakouts shown by functions and cost elements will not be useful in estimating future costs.

As a general rule, P&W views the recurring and nonrecurring distinction to be straight forward and not a problem area. Fixed and variable cost behavior analyses are

gaining increasing importance as DoD significantly alters its planned procurement quantities. Such analyses usually require additional data compared to what is currently available through the CCDR system to estimate cost effects. Required data include current information about the amount and composition of the business base, values of capital asset accounts (e.g., facilities and equipment), employment base (both direct and indirect), and forward-pricing rates. While some of these data are available in CCDRs, the data are not necessarily current or accurate. The most timely and relevant government data sources are the DPRO and the DCAA.

Report Formats

P&W considers the 1921 report to be the most reasonable and least burdensome of the CCDR requirements. From P&W's perspective, the 1921-1 and 1921-2 reports do not provide any meaningful data about the underlying functional processes for cost-estimating purposes. It is also P&W's judgment that the 1921-3 is a non-value-added report; P&W no longer prepares the 1921-3 through agreement with its government customers.

Once ABM is implemented, the 1921-1, 1921-2, and 1921-3 reports will be even less relevant. Cost reporting should incorporate summary-level process (activity) data that includes operational (direct), support (indirect/overhead), and administrative (indirect/general and administrative) costs. The WBS structure displayed in the 1921 report should be related to activity output identified through the ABM process.

CCDR Processing

P&W does not estimate the cost of CCDR preparation to be significant. The Cost Summary Data Report (1921) and the Functional Cost-Hour Report are prepared using automated PC systems. The Progress Curve Report (1921-2) is basically prepared from the 1921-1. P&W no longer prepares the Plant-Wide Data Report (1921-3). P&W program office personnel are generally responsible for the 1921, 1921-1, and 1921-2 reports. Accounting personnel for government contracts provide technical and automated systems support. All time spent on CCDR preparation is accounted for as indirect costs on production contracts. For R&D contracts, project personnel charge time as direct and general accounting personnel charge time as indirect for their efforts on CCDR report preparation. P&W did not provide any specific costs for CCDR preparation because most costs are charged as indirect and are not separately priced and negotiated.

CCDR quality does not appear to be an issue. P&W routinely performs quality reviews of the reports and generally considers them to be highly accurate. DCAA also

periodically reviews the CCDR reports and has not recently identified any significant problems.

In terms of frequency, P&W suggests CCDR reporting at the beginning and end of the contract. Early reporting at the outset of a contract establishes the appropriate data structure that both the government and contractor can agree upon. Reporting at contract completion provides the historical database (the primary purpose of CCDRs) for future CER and model development. P&W concurred with the concept of a centralized database provided strict proprietary controls were established and observed.

Raytheon Missile Systems Division, March 17, 1993

Summary

Raytheon personnel generally view the CCDR system as being a non-value-added reporting burden that should be eliminated. The data are not used for internal cost analysis or cost-estimating purposes. The CCDR's sole purpose is to satisfy DoD contractual requirements.

Raytheon noted that all of the required CCDR data are available in its existing accounting systems but not in the government-prescribed formats. Raytheon has developed an automated system to prepare the Cost Data Summary Report (1921) and the Functional Cost-Hour Report (1921-1). Reports are largely based on the existing C/SCSC database. These data are integrated with inputs to identify the recurring and nonrecurring breakout and a matrix that relates CPR Format 2 functions to functional cost data (1921-1). The Progress Curve Report (1921-2) and the Plant-Wide Data Report (1921-3) are manually prepared. Report preparation time is not considered to be significant.

Raytheon supports the concept of integrating CCDR and C/SCSC management, oversight, and reporting requirements to increase efficiency and effectiveness. Reporting data to assist in the fixed and variable cost analysis is worthwhile but difficult to specify. The most relevant data should be obtained from the DPRO and the DCAA. Raytheon agrees with the need for a centralized DoD database; however, Raytheon emphasizes the need for tight internal government controls to protect competition-sensitive data because CCDR data availability within the government would expand dramatically.

Uses and Utility

Raytheon does not systematically maintain hard copies of the CCDR reports and has not developed any automated databases, models, and so on, to make use of the data.

Raytheon personnel pointedly state that "there is no known usage/value of CCDR internally...CCDR is purely an external reporting requirement." At the same time, Raytheon acknowledges there may be some value to the government in collecting cost data. However, the present CCDR system is inefficient and collects a great deal of unnecessary data and at too frequent intervals (as discussed below in the report formats section).

Raytheon personnel understand and appreciate the government need for a cost database and how CCDRs may help satisfy that requirement. However, they object to other uses such as requiring voluminous (literally hundreds or thousands of pages of proposal phase pricing in 1921 and/or 1921-1 format) or imposing the CCDR reports as a "back door" CPR approach on contracts that specifically exclude CPR coverage (e.g., firm-fixed-price). The issue is not necessarily the data itself but the frequency and utility of detailed cost information (typically below contract WBS level 3). Raytheon personnel ordinarily consider such data to be overkill, an inefficient use of resources, and probably not even used (as evidenced by the absence of government questions).

Raytheon considers the distinction between recurring and nonrecurring costs to be relatively straight-forward and easily made. For example, the engineering function (excludes engineering personnel loaned to sustaining functions such as manufacturing) is considered to be nonrecurring. The classification decision is made when the projected CCDR reports are submitted in response to DoD requests for proposals (RFPs) and consistently maintained in subsequent reports throughout the contract life cycle. Raytheon recognizes that fixed and variable cost analyses are becoming increasingly more important with defense downsizing and related declines in weapon system procurement quantities. Such cost segregation is not easily made. However, the best data available to support that analysis (e.g., data about the business base, specific plant programs, and forward-pricing rates) already exists and can be obtained from the DPRO and DCAA.

Report Formats

Raytheon uses the C/SCSC database and standard CPR-CCDR matrices as the starting point for CCDR report preparation. Project personnel identify recurring and nonrecurring data for input into the 1921 automated system. They also verify the matrix that relates CPR Format 2 functions or lower level departments to the 1921-1 categories (engineering, tooling, etc.). Raytheon views the data elements within the CCDR as being generally straight-forward and not requiring detailed explanations as provided in the CCDR pamphlet (e.g., direct labor). Raytheon would prefer the more simple and direct approach employed in the C/SCSC guidance. Raytheon offers subcontractors the opportunity to

submit CCDRs through Raytheon or directly to DoD. Historically, companies have elected to send their reports directly to DoD.

Raytheon proposed the following specific changes to the CCDR system:

- Cancel the CCDR as a contract data requirements list (CDRL) item. If reporting is still determined to be necessary, the DPRO or DCAA could prepare substitute reports.
- Cancel the 1973 CCDR pamphlet as being unnecessary because the data item descriptions and report formats are self-evident.
- If the CCDR continues as a contractor requirement, submit reports at or after contract completion. In any case, limit CCDR frequency to annual submissions; specifically, exclude monthly or quarterly submissions.
- The CPR provides basically the same data as the 1921 report without the recurring and nonrecurring breakout. This breakout could be added to the CPR. In those cases where cost data is required but there is no requirement for a CPR, the contractor would submit a modified CPR (e.g., without earned value and related analysis).
- The 1921-2 report should not be required on EMD contracts and single lot production contracts.
- The 1921-3 should be eliminated; any relevant overhead type data should be obtained directly from the DPRO or DCAA.
- Eliminate the requirement to submit CCDRs in response to RFPs particularly "when so structurally detailed to explode into thousands of cost pages."
- Do not allow the "CCDR Data Plan" to dictate the performance measurement for the CWBS. Provide for different levels of WBS reporting for CCDRs and CPRs. Raytheon suggests that the typical CCDR reports should capture costs at a higher summary level than CPRs, but using the performance measurement for the CWBS.
- Allow for submission of contractor automated CCDR reports as is provided for CPR submissions.
- Upgrade Performance Analyzer (PA) to include a contractor-provided matrix converter (matrix of recurring versus nonrecurring and 1921-1 categories) from CPR data to CCDR. Add a CCDR 1921 and 1921-1 report capability.

CCDR Processing

Raytheon program office personnel are generally responsible for preparing the 1921, 1921-1, and 1921-2 reports. General accounting personnel are responsible for preparing the 1921-3 report. Project personnel charge CCDR report preparation time as

direct and accounting personnel charge time as indirect. The cost of the 1921, 1921-1, and 1921-2 preparation are estimated separately but typically are negotiated as part of a group that does not allow for specific cost determination.

The automated CCDR system routinely performs internal checks to ensure the accuracy of the data. In addition, both project and financial personnel review the reports before submission. Raytheon notes the key to reporting accuracy and timeliness is twofold. First, significant time must be invested up-front when responding to RFPs with projected CCDRs. It is here that the major decisions regarding cost classification (e.g., composition of contract WBS structure, recurring versus nonrecurring, and cost elements) are made. Secondly, automation not only significantly enhances efficiency but requires early analysis to structure the input data (e.g., functions to WBS matrix).

APPENDIX B

SURVEY PARTICIPANTS' ASSESSMENT OF THE CCDR SYSTEM

APPENDIX B

SURVEY PARTICIPANTS' ASSESSMENT OF THE CCDR SYSTEM

We were most interested in obtaining the views, opinions, and ideas from the people who worked closely with the CCDR system—the contractors who prepare the reports and the DoD cost analysts who process and use the data. They know the system better than anyone else and can identify its weaknesses and recommend areas for improvement.

Cost analysis organizations often establish the requirements for the data, but do not pay for and may not use the data. This appendix summarizes the results from our survey of the key players to develop CCDR system improvements. Our findings are shown in Tables B-1 through B-3, presented at the end of this appendix. Summaries of discussions with the individual organizations can be found in Appendix A, which is organized by Component within DoD (Army, Navy, Air Force, and Defense Agency) and by contractor. Please note that we had to make some judgments when categorizing comments of an individual organization because the survey responses and supporting narratives did not always provide clear distinctions.

DOD COST ANALYSIS ORGANIZATIONS

DoD cost analysis organizations obtain actual cost data from standard reporting systems such as the CCDR system or through ad hoc requests from program offices, other cost analysis organizations, and contractors. Cost analysis organizations typically have cost-estimating responsibilities for numerous different programs, but are removed from the primary source of data (contractors). This situation contrasts with that of POs, who ordinarily have ready access to their program's major contractors. As a result, cost analysis organizations tend to be proponents of recurring cost reporting systems, as was borne out in our CCDR survey results.

Uses and Utility

Table B-1 summarizes the survey results for cost analysis organizations. All the cost analysis organizations agree that the CDDR system is necessary and support its continuance. However, those same organizations generally were using the data only on a limited basis to perform their cost-estimating functions. Based on their comments, we categorized two organizations as extensive users, three as limited users, and six as not currently using the data much.

The utility of the various reports varied widely. The 1921 and 1921-1 appear to be the most useful and should be continued without question. The utility of the 1921-2 was confirmed by some (three), questioned by others (two), and not commented upon as being either favorable or unfavorable by most (six). One of the confirming organizations stated that it was the most useful CCDR report. Given that nine organizations indicated that the report is seldom used or not used at all, the 1921-3 should be a candidate for elimination. Only one organization stated that the 1921-3 data were used extensively (which appeared to conflict with the same organization's comments about not using the general CCDR data very much). Most of the organizations not using the 1921-3 data generally were using overhead rates from other sources that typically reflected forward pricing rate agreement (FPRA) rates. In effect, the cost analysis organizations focused almost exclusively on analyzing and estimating direct costs. Indirect or overhead costs were typically accepted as a given (from FPRA data) and were simply added to the direct costs.

We were most interested in why organizations said they needed the data but were not using them. The participants identified five major causes.

First, most of the organizations thought that the system was not being enforced starting at the OSD level and carrying through all subordinate levels of the DoD. Four organizations stated that the acquisition and cost analysis communities report through different command channels, a practice that limits the ability of the cost analysis organizations to enforce policies that directly affect program offices that are in the acquisition chain. Strong leadership and management were needed at all levels.

Second, eight organizations cited a lack of cost analysis resources. Personnel were needed on other estimating-related tasks judged to be of higher priority. One organization specifically recommended that three additional positions be established at the OSD level for a tri-Service group that would be dedicated to overseeing and administering the CCDR system. However, one of the eight organizations questioned whether the redirection of existing resources would be worth the marginal benefit gained by better CCDR reporting.

Third, the accuracy and consistency of CCDR data were considered by nine of the eleven organizations to be questionable because of the absence of any systematic validation. CCDRs simply are not being reviewed largely as the result of the first two causes—lack of leadership and shortage of resources. Typically, CCDRs are not validated until the data are used for a specific cost analysis purpose, which may occur several years after the last data have been collected. Most cost analysts we talked to acknowledged a general reluctance to use CCDR data because they were aware that the quality of the data was suspect and that required validation could be difficult and time-consuming.

Fourth, only two organizations specifically cited data availability as an important problem. However, we inferred from their unanimous support for the centralized, automated database that current availability of data is limited and that ready access to relevant data will enhance usage. Two organizations expressed concern about the automated system in that unchecked/uncontrolled access to CCDR data could result in the misuse of data due to from a lack of knowledge and understanding on how the data were constructed. They support controls to ensure that the owner of the data is at least made aware of other organizations that access the data.

Fifth, seven respondents noted that no formal training courses deal with either the content or use of CCDR data. Any CCDR training had to be provided on an ad hoc basis as an additional task by someone in the organization who had the background and experience in working with CCDRs. Several of the survey participants noted that their younger work force were particularly unfamiliar with the CCDR process and its role in cost estimating.

Other factors that adversely affect data availability include the failure to include CCDR requirements in firm-fixed-price contracts (four comments) even when required by directives. One other organization also noted that current guidance generally excludes CCDRs on firm-fixed-price contracts for ACAT II programs and some subcontractors on ACAT I programs. They feel such exceptions should be eliminated. Another participant felt that the formal guidance should emphasize the importance and need for subcontractor data.

Three respondents complained about the lack of detailed data in the CCDR system. Two other organizations indicated that the CAIG should provide additional flexibility in allowing additional requirements so that the data have more utility for the cost estimators at their levels.

Report Formats

We received a relatively small number of specific recommendations to improve the CCDR formats, mostly because the majority of suggestions were received from only two organizations. We attributed the absence of widespread comments to two factors. First, the formats, the data elements, and guidance were generally adequate and satisfied the need for cost analysis data (excluding the level of detail and variations from the prescribed WBS structure). Second, the respondents were not using the data enough to develop many specific conclusions and recommendations about the data.

Eight respondents pointed out the need for data to track system definition. These data include programmatics (e.g., acquisition environment, competition, type contract, etc.), and technical and physical characteristics (including performance measures). While the organizations clearly believe that such data were essential, there were no clear recommendations on how the data should be collected. Most participants felt that the data should not be prepared by the cost analysts and included as part of the CCDR submission. They preferred to capture the data directly from the technical personnel on an ad hoc basis. Three organizations noted that most of the basic data are available in the Cost Analysis Requirements Document (CARD). Another organization recommended that the contractor and/or program office reference a source document for technical data in the remarks section of the CCDR report.

Six organizations recommended that contractors should provide a summary of major accounting changes and their effects on CCDR reporting as part of the remarks section. Such information is necessary to validate and normalize the data. One organization proposed that contractors also provide a cross-walk between their accounting systems and the CCDR reports. Five survey participants stated that consideration should be given to combining selected CCDR elements of the CCDR and CPR report such as adding the recurring and non-recurring breakout to Format 1 of the CCDR report. On the other hand, members of one organization strongly opposed combining any elements because, they asserted, the systems serve two different purposes and two different customers.

Most of the organizations we surveyed indicated that the CCDR pamphlet issued in 1973 needed updating; however, only two respondents expressed serious concern over the pamphlet that necessitated a major revision. One of these organizations provided several specific recommendations: that the pamphlet address subcontractor compliance with Military Standard 881, include differences in commodities, explore recent acquisition trends, develop WBSs for unique commodities, expand the recurring and non-recurring

definitions to include specific examples, and emphasize the need for unit cost reporting on the 1921-2 report.

Three organizations recommended that the functional breakout in the 1921-1 report be expanded or made more flexible. One of those organizations offered several detailed additions: engineering hours to support manufacturing, special test equipment within the tooling category, quality control labor for inspection and test, and manufacturing labor for fabrication and assembly.

Another organization indicated that functional category reporting should be made more flexible to accommodate new processes and management approaches. The same organization also noted that the other cost category in the 1921-1 report often contains excessive costs (which should be assigned to another data element) and needs to be monitored and controlled. The organization's representatives further recommended that quantity data should be included in the 1921-1 report. Another organization suggested that engineering and tooling be added to cost structure on the 1921-2 report. Finally, one organization suggested that data collection reflect the CAIG's presentation requirements and that reporting frequency be reduced to the end of the contract only, because interim cost data are of little, if any, value.

CCDR Processing

Only two of the cost analysis organizations we surveyed had developed written procedures for processing CCDRs. Respondents generally did not see the need for additional formal procedures because they considered the existing system and guidance to be adequate. We largely attributed the absence of formal procedures to the general non-use of the data.

Although validation activity can be considered to be part of CCDR processing, we elected to include it in the uses and utility section because its absence seriously impaired potential cost-estimating usage. This condition was further compounded by the apparent lack of DCAA involvement in auditing the CCDR system. DCAA is supposed to periodically (usually annually) conduct audits. However, ten of the eleven organizations stated they were not aware of any DCAA involvement. This contrasts with the audit reports received by the CAIG that indicate DCAA activity is much more widespread. However, the CAIG could not provide us with a specific assessment of the DCAA coverage. Clearly, if the DCAA audits are being performed, the results are not being communicated to all interested parties.

Four organizations including, the three Service cost centers/agencies, noted that they were not receiving all the CCDR reports they were supposed to. The CCDR planning process appeared to be working reasonably well; only two organizations indicated that they were not consistently participating in the approval cycle for CCDR plans. One other organization stated that OSD was neither providing any feedback on the status of CCDRs nor helping access other CCDR data.

At the time of our visits, survey participants were unable to provide any estimates for CCDR costs. While most organizations stated that they needed additional resources, only CEAC, NCA, and ATCOM provided specific estimates. CEAC was using three-fourths of a man-year but felt five man-years were required to adequately process CCDRs. NCA had one person working part time but needed two full-time personnel. ATCOM expressed a need for one to two additional personnel. Seven of the eleven organizations felt that contractor costs were not significant. The other four organizations did not provide an opinion.

DOD PROGRAM OFFICES

DoD program offices (POs) are very important players in the CCDR process. They are responsible for identifying requirements in the CCDR Plan, obtaining necessary approval through the established DoD management structure, implementing the requirements in the contract, initially reviewing the data after report receipt, and paying for the data. POs usually have less need for CCDR data than other organizations because they have ready access to alternative sources of data that can be obtained directly from their contractors.

We discussed the CCDR system with six program offices. However, as previously noted, we had a combined meeting with the F/A-18 and Air-to-Air Missile POs. We actually met representatives of the NAVAIR Cost Division who provide cost analysis support to those POs through matrix management. We prepared one summary for both organizations, which we felt was appropriate because their views, experiences, and recommendations were similar.

Table B-2 summarizes the survey results for POs.

Uses and Utility

Like the cost analysis organizations, the POs were unanimous in their support for the CCDR system. We classified three organizations as limited users, and two organizations as non-users.[1] The 1921, 1921-1, and the 1921-2 reports were considered to be of equal utility. One PO felt that the type data contained in the 1921-2 was losing value because direct labor was declining in importance as a cost driver while engineering complexity was increasing in importance. The 1921-3 is the least used report. Four of the organizations indicated that it was either never or infrequently used. For the most part, POs, like the cost analysis organizations, preferred to use the overhead data contained in FPRA ich they felt were the most current and accurate data available.

The POs identified the same five basic causal factors for the limited use of CCDR data as the cost analysis organizations. However, the details surrounding the factors and the extent of PO support varied in some instances, as explained below.

First, the lack of enforcement and leadership at all levels of DoD was mentioned by only one PO.

Second, a shortage of resources was cited by only one PO. The PO analysts apparently felt that resources were available if CCDR processing was given higher priority within the PO. A contributing factor was the nature of the work. Several cost analysts informally mentioned that validating data was not very popular because it is a tedious and time-consuming activity. PO analysts do not voluntarily validate the data unless they have a specific reason for doing so.

Third, the questionable validity of CCDR data was mentioned by three POs as a barrier to usage that could be overcome only with mandatory and systematic validation.

Fourth, the lack of ready access to CCDR data from other organizations often precluded usage. Four POs supported the concept of a centralized, automated database but with more qualifications than cited by the cost analysis organizations. However, three of those POs expressed concern over the potential misuse of data because external users probably would not be sufficiently familiar with the program or the contractors' accounting systems. In addition, the problem with the questionable accuracy of the data was noted by three of the five POs. One PO indicated that access to program data varied extensively, some organizations being very responsive (typically other POs) and others not being

---

[1] The B-2 PO was considered to be a non-user of CCDR data, though the PO made extensive use of its own Program Cost Report, as shown in Table B-2.

responsive at all (usually the Service cost centers/agencies and the CAIG). Four POs noted that they needed more flexibility to change requirements involving level of detail reported, reporting frequency, and exceptions to the standard WBS elements prescribed in Military Standard 881.

Fifth, one PO noted the lack of available CCDR training that made the understanding and use of CCDRs more difficult, especially for new cost analysts.

Report Formats

All the POs stated that tracking program, technical, and performance data were necessary for cost estimating. Such data were ordinarily obtained from technical personnel within the PO. The POs were generally opposed to including these data in the CCDR because of potential accuracy problems from having those who prepare the CCDR reports (typically accounting or financial personnel) collect and report the data. Only one PO indicated that a technical summary in narrative form should be incorporated into the CCDR. Another PO pointed out that the costs shown in the 1921 and 1921-1 reports may reflect two or more system configurations. They recommended that POs be allowed to work around this problem by establishing unique hardware type WBS elements to account for the different costs.

Two POs proposed that the contractor should include major accounting changes and their CCDR effects into the reporting system. The same two POs also recommended that the contractors be required to provide a "cross-walk" between the data elements in their accounting systems and the data elements in the CCDR reports. We feel the other POs would support these recommendations based on their comments regarding the accuracy and consistency of the reported costs. One PO, in particular, pointed out a problem where subcontractors had different accounting systems and often had different interpretations of what was to be included in the various report categories (e.g., recurring versus non-recurring).

Like the cost analysis organizations, the POs had divergent views on whether to consider combining CCDRs and CPRs. Two POs favored the proposal and one opposed. One PO noted that no quantity data were provided for the 1921 and 1921-1 reports. The PO also recommended that a more flexible WBS was necessary during research and development to accommodate the unique activities that are likely to occur.

CCDR Processing

Only one PO had developed written instructions for preparing and processing its PCR (see the footnote to Table B-2). This was necessary because of some of the unique features of the report. However, it was our understanding that formal procedures were not established for the CCDR report that was eliminated about three years ago.

As was the case with cost analysis organizations, the lack of validation was exacerbated by the apparent lack of DCAA involvement in auditing the CCDR system. Three POs were not aware of any DCAA activity. The other two POs knew that the DCAA received the CCDR reports but had never received audit reports or otherwise been made aware of specific audit results. Despite the relative absence of validation, two POs believed that the quality of CCDR data was high. The other POs were more concerned with reporting consistency across contracts and contractors.

None of the POs provided a specific cost estimate for CCDR preparation costs. One PO provided a contract pre-negotiation estimate but could not identify the actual cost negotiated because it was combined with many other elements. Three POs felt that contractor costs for CCDR preparation were not significant. One PO chose not to provide any estimate. In addition, no estimates were provided for internal PO costs; however, all thought such costs were not significant.

CONTRACTORS

We visited and surveyed each contractor separately (as we did with the DoD organizations), although their views on the overall CCDR system were similar. Table B-3 summarizes the survey results for cost analysis organizations.

Uses and Utility

The seven contractors were unanimous in their assessments on the following points:

- The CCDR system is a non-value-added activity.
- CCDR data are not used for any internal operations.
- CCDR reports are prepared solely to satisfy DoD contractual requirements.
- DoD is not using the data (an assessment based upon the almost total absence of questions or comments).
- CCDRs should be eliminated as a reporting requirement.

We also noted that the National Security Industrial Association (NSIA) position paper provided to us on CCDRs (reproduced here as Appendix C) strongly supported the first four points. Other NSIA recommendations emphasized the need to combine CCDRs and CPRs and to reduce reporting frequency and the level of detail requested.

Despite these criticisms, the contractors generally agreed that the CCDR data had the potential for effective use by DoD. However, they also agreed that they did not expect DoD to ever use the data. Three contractors suggested that new ways of doing business (e.g., integrated product teams, activity based costing) may make historical CCDR data less relevant. The contractors did not provide many specific comments about the utility of each report format. The only clear consensus was provided by four contractors who stated that DoD should use the FPRAs for estimating future overhead costs rather than the 1921-3. We are of the opinion that the three other contractors would support this position.

None of the contractors voiced opposition to the proposed centralized, automated system. Five contractors were concerned about the possible dissemination of their proprietary data and the need for stringent controls as the opportunity for unauthorized release would increase dramatically. One contractor also pointed out the potential for misuse of the data by people who do not understand how the report was prepared.

Four companies noted that DoD often requests data at too low a level of detail particularly in the 1921-1 report. One company felt such detail may be counterproductive because the accuracy below WBS level 3 reporting is suspect.

Report Formats

The most frequently recommended action was to reduce CCDR reporting frequency. Six of the seven contractors offered alternative ways (two companies provided more than one) to decrease submissions from the CAIG-established policy (semi-annually during R&D and the first several years of production and annually thereafter). Four companies proposed reporting at the end of the contract only. One company suggested that the reporting cycle should be at the beginning and the end of the contract. Another company suggested that any reporting at more frequent intervals (e.g., quarterly or monthly) than those prescribed by the CAIG should be prohibited. One company proposed eliminating the requirement for submission of the CCDR as part of the response to the RFP. Finally, one contractor stated that submittals should be tied to major program events (e.g., critical design reviews, major milestones).

The next most popular recommendation was to combine selected CCDR formats with equivalent CPR formats. Specifically, the 1921 and 1921-1 reports could be integrated with Formats 1 and 2 of the CPR, respectively. One company proposed that programs be allowed to establish a WBS that has been tailored for the unique requirements of the individual program. Other recommendations provided by one company included allowing for different levels of reporting for the CCDR and CPR within the CCDR Plan and expanding the Performance Analyzer software (now being used for CPRs) to accommodate CCDRs.

As noted previously with the DoD organizations, the twenty-year-old CCDR pamphlet generally was not considered to be a major problem. Preparation guidance was considered adequate. Only two companies specifically mentioned that the pamphlet needed updating. One of these companies provided an example to indicate possible problems with data element definitions: the Other Cost category in the 1921-1 report frequently contains a significant amount of costs that may indicate that the other definitions may not be sufficiently clear or comprehensive. One other company indicated that CCDR data elements were self-explanatory and that the CCDR pamphlet should be eliminated.

One company proposed a very different approach for providing guidance. The company noted that substantial improvements could be made in preparing and understanding the report. First, the CCDR and C/SCSC instructions should be integrated and included in the DoD 5000 series of documents. Second, the instructions should describe how to prepare and how to read each of the report formats. Third, the CCDR and C/SCSC data element descriptions should be made the same or at least compatible with each other.

The remaining recommendation was made by one company, who emphasized the importance of performance measurements (e.g., speed, time,) as independent variables for predicting future costs. They considered physical attributes (e.g., size, weight) and cost elements (including the direct and indirect breakout) to be of less relevance. Focusing on performance measurements and total costs would greatly facilitate the use of historical cost databases as technologies and accounting systems continue to undergo major changes.

Another recommendation that was also shown in the DoD section was to disclose major accounting changes and their effects on CCDR reporting in the remarks section. One company pointed out the difficulty in requiring subcontractors to provide CCDR reports through the prime rather than going directly to OSD. Many subcontractors are unwilling to provide the CCDR level of detail to potential competitors such as the prime. This necessitated the prime having to estimate the detailed breakout. To avoid these potentials for

inaccuracies, the company recommended that all major subcontractors report to DoD without going through the prime.

A proposal was made to exempt the 1921-2 reporting requirement for prototypes during the EMD phase and for single lot production contracts. Costs of prototype hardware were not considered to be indicators of future costs that reflect stable designs and manufacturing processes. Finally, there was a recommendation to eliminate what we call "as if" accounting. The CCDR pamphlet requires that for airframe manufacturers certain types of equipment such as landing gear must be included in the Purchased Equipment category even if the item was manufactured within the contractor's own plant.

CCDR Processing

Two contractors had developed written instructions to facilitate CCDR preparation. The contractors were more confident than the DoD organizations about the quality of CCDR data. Six of the seven companies routinely performed quality checks before the reports were released and distributed. The other company's internal quality control function was limited to ensuring the reports were prepared and distributed on time.

Contractors were slightly more aware than their DoD customers of DCAA involvement in the CCDR process. Four of the seven contractors were unaware of any recent DCAA reviews or audits (compared to thirteen of the sixteen DoD participants). One of the other three contractors was recently advised that a CCDR audit would be conducted. Only one contractor specifically stated that they were familiar with DCAA audit results.

All the contractors agreed that the recurring costs to prepare the CCDR reports were not significant. However, some pointed out that the non-recurring costs could exceed recurring in a given year if the contractor's automated accounting system had to be changed to accommodate detailed WBS elements. Four contractors provided rough cost estimates for CCDR efforts, which are discussed in Appendix I.

Table B-1. Survey Results: DoD Cost Analysis Organizations

	CEAC	ATCOM	MICOM	SSDC	NCA	NAVAIR	NAVSEA	AF/FMC	ASC	AFSMSC	BMDO
USES AND UTILITY											
Supports need for CCDR system	X	X	X	X	X	X	X	X	X	X	X
Uses CCDR extensively	—	—	X	—	—	X	—	—	—	—	—
Limited user	—	—	—	X	—	—	X	—	X	—	—
Not currently used much and have not developed many models or CERs based on CCDR data	X	X	—	—	X	—	—	X	—	X	X
Report Utility											
-1921 &1921-1 are most useful	X	—	—	—	—	X	—	—	—	—	—
-1921 is most useful	—	—	—	X	—	—	—	—	—	—	—
-1921-1 is most useful	—	—	X	—	—	—	—	X	—	—	—
-1921-2 is most useful	—	—	—	—	—	—	—	—	—	—	X
-1921-2 has some utility	X	—	—	—	—	—	—	—	—	—	—
-1921-2 is a candidate for elimination	—	—	—	—	X	X	—	—	—	—	—
-1921,-1,-2 have about same utility	—	X	—	—	—	—	—	—	—	—	—
-1921-3 is seldom used or not used	X	X	X	X	—	X	—	X	X	X	X
-1921-3 is often used	—	—	—	—	X	—	—	—	—	—	—
Lack of enforcement/leadership	X	X	—	X	X	X	X	X	—	—	X
POs are not customers and report through acquisition chain	X	X	X	—	X	—	—	—	—	—	—
Lack of Resources	X	X	X	X	X	X	—	X	—	—	X
- Recommend tri-Service group at OSD	—	X	—	—	—	—	—	—	—	—	—
Questionable data due to absence of systematic validation	X	X	X	X	—	X	—	X	X	X	X
Developed and/or supports automated system	X	X	X	X	X	X	X	X	X	X	X
- Data availability from other organizations is a problem	—	—	X	—	—	—	—	X	—	—	—
-Potential misuse of data	—	X	—	—	—	—	X	—	—	—	—

Table B-1. Survey Results: DoD Cost Analysis Organizations (continued)

	CEAC	ATCOM	MICOM	SSDC	NCA	NAVAIR	NAVSEA	AF/FMC	ASC	AFSMSC	BMDO
-CCDR requirements are not always put on contract (particularly firm-fixed-price)	X		X	X	—	—	—	X	—	—	—
-Eliminate exceptions regarding CCDR reporting for firm-fixed-price contracts	—	—	—	—	—	X	—	—	—	—	—
-Emphasize need for subcontractor data	—	—	—	—	—	—	—	—	X	—	—
-Lack of CCDR detail	X	—	X	—	—	—	—	X	—	—	—
-Need flexibility to add requirements	—	X	—	—	—	—	—	—	—	—	X
Lack of training	—	X	—	—	X	X	X	X	X	X	—
REPORT FORMATS											
Need to track system definition (program, technical, and performance data)	X	X	X	X	X	X	X	—	—	—	X
Include major accounting changes and their effects	X	—	—	—	X	X	—	X	X	—	X
Contractors should provide a cross-walk between their system and the CCDRs	—	—	—	—	—	—	—	—	—	—	X
Consider combining selected CCDR and C/SCSC reports	—	X	—	X	X	—	—	—	X	X	—
Opposes any CCDR and C/SCSC report consolidation	—	—	—	—	—	X	—	—	—	—	—
CCDR pamphlet needs major update	—	X	X	—	—	—	—	—	—	—	—
-Address need for subcontractor compliance with Military Standard 881	—	X	—	—	—	—	—	—	—	—	—
- Include implications for differences among commodities	—	X	—	—	—	—	—	—	—	—	—

Table B-1. Survey Results: DoD Cost Analysis Organizations (continued)

	CEAC	ATCOM	MICOM	SSDC	NCA	NAVAIR	NAVSEA	AF/FMC	ASC	AFSMSC	BMDO
- Recent acquisition trends including multiyear procurement, teaming, integrated product teams, concurrent engineering, and other continuous improvement techniques	—	X	—	—	—	—	—	—	—	—	—
- Establish WBSs for items not shown in Military Standard 881	—	X	—	—	—	—	—	—	—	—	—
- More detailed description of recurring and non-recurring with examples	—	X	—	—	—	—	—	—	—	—	—
- Clarify and emphasize need for unit cost reporting in 1921-2	—	X	—	—	—	—	—	—	—	—	—
Expand the functional breakout of 1921-1	—	—	X	X	—	X	—	—	—	—	—
- Show engineering hours for manufacturing	—	—	—	—	—	X	—	—	—	—	—
- Show special test equipment within tooling	—	—	—	—	—	X	—	—	—	—	—
- Show quality control labor for inspection and test	—	—	—	—	—	X	—	—	—	—	—
- Show manufacturing labor for fabrication and assembly	—	—	—	—	—	X	—	—	—	—	—
1921-1 may need more flexibility to accommodate changing functions	—	—	X	—	—	—	—	—	—	—	—
Other cost category requires control	—	—	X	—	—	—	—	—	—	—	—
Add quantity data for the 1921-1	—	—	X	—	—	—	—	—	—	—	—
Add engineering and tooling to 1921-2	—	X	—	—	—	—	—	—	—	—	—

Table B-1. Survey Results: DoD Cost Analysis Organizations (continued)

	CEAC	ATCOM	MICOM	SSDC	NCA	NAVAIR	NAVSEA	AF/FMC	ASC	AFSMSC	BMDO
CCDR data collection should reflect data presentation requirements established by the CAIG	—	—	—	—	—	—	—	—	—	—	X
Reduce reporting frequency to end of contract	—	—	—	—	—	—	—	—	—	—	X
CCDR PROCESSING											
Written CCDR system procedures	—	X	—	—	X	—	—	—	—	—	—
Not aware of DCAA audits	X	X	X	X	—	X	X	X	X	X	X
CCDR reports are not always received	X	—	—	X	X	—	—	X	—	—	—
Frequently by-passed in the CCDR Plan approval process	—	—	—	X	X	—	—	—	—	—	—
OSD provides no CCDR feedback or help in accessing data	—	X	—	—	—	—	—	—	—	—	—
CCDR Costs	—	—	—	—	—	—	—	—	—	—	—
- 3/4 of a man-year but need 5	X	—	—	—	—	—	—	—	—	—	—
- Need 2 full time	—	—	—	—	X	—	—	—	—	—	—
- Need additional 1-2 people	—	X	—	—	—	—	—	—	—	—	—
- No estimate for contractor costs	X	X	X	X	—	—	—	—	—	X	—
Believe contractor costs are not significant	X	X	X	—	—	X	X[a]	X	X	—	—

[a] NAVSEA estimated that non-recurring costs are significant and recurring costs are not significant.

Table B-2. Survey Results: DoD Program Offices

	Comanche	Hellfire	F/A-18 and Air-to-Air	B-2[a]	F-16
USES AND UTILITY					
Supports the need for the CCDR system	X	X	X	X	X
Uses CCDR extensively	—	—	—	X	—
Limited user	X	X	X	—	—
Does not use at all	—	—	—	—	X
Report Utility	—	—	—	—	
- 1921-3 is seldom or never used	X	X	—	X	X
Lack of enforcement/leadership	X	—	—	—	—
Lack of resources	X	—	—	—	—
CCDRs are generally not validated	X	X	—	—	X
Supported but concerned about centralized, automated database	X	X	X	—	X
- Potential misuse of data	X	X		—	X
- Questionable accuracy because of lack of validation	X	X	X	—	—
- Access to data from other organizations varied	—	X	—	—	—
- Need flexibility to change requirements (e.g., WBS and reporting frequency)	X	X	X	X	—
Lack of training	—	—	—	X	—
REPORT FORMATS					
Need to track system definition (program, technical, and performance data)	X	X	X	X	X
- Need to track different system configurations	—	X	—	—	—
Include major accounting changes and their effects	X	—	X	—	—

Table B-2. Survey Results: DoD Program Offices (continued)

	Comanche	Hellfire	F/A-18 and Air-to-Air	B-2[a]	F-16
Contractors should provide cross-walk between their accounting systems and CCDRs	X	—	X	—	—
Consider combining CCDRs with CPRs	—	—	—	X	X
Opposes the combining of CCDRs with CPRs	X	—	—	—	—
Include quantity data for 1921 and 1921-1 reports	—	X	—	—	—
Need flexible WBS structure in R&D	—	X	—	—	—
CCDR PROCESSING					
Developed written instructions	—	—	—	X	—
Not aware of any DCAA involvement	X	—	X	X	—
- Believes CCDR quality is high	—	X	—	X	—
Contractor costs are not significant	—	—	X	X	X

[a] The B-2 PO began receiving CCDR reports in 1986. At the same time they were receiving their own developed Program Cost Report that contained much of the same data as the CCDR. As a result, they eliminated the CCDR about three years ago. This table reflects the PO's experience with the PCR.

Table B-3. Survey Results: Contractors

	GE	LFWC	LASC	MDA	NAD	P&W	Raytheon
USES AND UTILITY							
Non-value added	X	X	X	X	X	X	X
Not used for any internal purposes	X	X	X	X	X	X	X
Produced solely for DoD	X	X	X	X	X	X	X
Observed that DoD is not using	X	X	X	X	X	X	X
CCDRs should be eliminated	X	X	X	X	X	X	X
1921 is most useful	X	—	—	—	—	X	—
1921-2 has some utility	X	—	—	—	—	—	—
1921-1 and 1921-3 are least useful	X	—	—	—	—	—	—
1921-1,-2, and-3 are not useful	—	—	—	—	—	X	—
New ways of doing business may make historical data less relevant	X	—	—	—	X	X	—
Eliminate 1921-3 and use FPRAs for estimating future costs	—	—	X	—	X	X	X
Does not oppose DoD automated database	X	X	X	X	X	X	X
- Concerned about misuse	—	—	—	X	—	—	—
- Concerned about dissemination of data	—	—	X	X	X	X	X
DoD requests too much detail	X	X	—	X	—	—	X
Accuracy and utility of reporting below level 3 is suspect	X	—	—	—	—	—	—
REPORT FORMATS							
Reduce reporting frequency	X	X	—	X	X	X	X
- Data dump at end of contract	X	X	—	X	—	—	X
- Report at beginning and end only	—	—	—	—	—	X	—
- Prohibit any quarterly or monthly	—	—	—	—	—	—	X

Table B-3. Survey Contractors Results (continued)

	GE	LFWC	LASC	MDA	NAD	P&W	Raytheon
- Reduce report frequency to end of contract or beginning, middle, and end	—	X	—	—	—	—	—
- Eliminate requirement to submit	—	—	—	—	—	—	X
CCDR in response to RFP	—	—	—	—	—	—	—
- Tie report submissions to major program events	—	—	—	—	X	—	—
Combine 1921 and 1921-1 with CPR	—	X	X	—	X	—	X
- Tailor WBS to unique program	—	—	X	—	—	—	—
- Provide for different levels of reporting in CCDR Plan for CCDRs and CPRs	—	—	—	—	—	—	X
- Upgrade Performance Analyzer to provide a 1921 and 1921-1 capability	—	—	—	—	—	—	X
Pamphlet needs updating	—	X	X	—	—	—	—
- Other Cost in 1921-1 can be significant which may result from inadequate definitions in other cost elements	—	—	X	—	—	—	—
Pamphlet should be eliminated	—	—	—	—	—	—	X
Report guidance should be expanded to enhance preparation and understanding	—	—	—	—	X	—	—
Include major accounting changes and their reporting effects in remarks section	—	—	—	X	—	—	—
Incorporate performance measurements for cost estimating	—	—	—	—	—	X	—
Require major subcontracts report to DoD and not to prime	—	—	—	—	X	—	—

Table B-3. Survey Contractors Results (continued)

	GE	LFWC	LASC	MDA	NAD	P&W	Raytheon
Exclude 1921-2 from EMD contracts and single lot production contracts	—	—	—	—	—	—	X
Objected to "as if" accounting, e.g., landing gear in Purchased Equipment even if in-plant manufacturing	—	—	—	X	—	—	—
CCDR PROCESSING	—	—	—	—	—	—	—
Developed written processing procedures	—	X	—	X	—	—	—
Routinely performs quality control and considers reports to be very accurate	—	X	X	X	X	X	X
Reports after contract award are monitored for timeliness only (no quality control)	X	—	—	—	—	—	—
Not aware of any DCAA involvement	X	X	—	X	X	—	—
Not aware of any DCAA involvement but will begin soon	—	—	X	—	—	—	—
Costs are generally not significant	X	X	X	X	X	X	X

APPENDIX C

NSIA COMMENTS

NATIONAL SECURITY INDUSTRIAL ASSOCIATION

National Headquarters

1025 Connecticut Avenue, N.W.
Suite 300
Washington, D.C. 20036
Telephone: (202) 775-1440
FAX: (202) 775-1309

13 August 1993

Mr. Jack Cloos
Cost Analysis and Research Division
Institute for Defense Analysis
1801 N. Beauregard Street
Alexandria, VA 22311

RE: CCDR Survey

Dear Mr. Cloos:

Attached is the position paper that Mr. Levins, Chair, NSIA Management Systems Subcommittee, agreed to provide as input from the Subcommittee in response to your survey on the CCDR.

We are pleased to work with you in efforts to investigate ways to streamline DoD reporting requirements and provide value added data to our DoD programs.

It is our intent to understand DoD's needs and support them as efficiently and economically as possible. If we can be of any further assistance, please contact me or Jim Levins.

Sincerely,

E.H. Schiff
Director for Procurement

EHS/mdd
Enclosure:
Survey Response Form

Following is the NSIA Management Systems Subcommittee's response to the CCDR SURVEY TOPICS : CONTRACTORS:

Primary Areas of Interest : The following is offered in response to the survey questions :

a. No one in the respective companies uses the CCDR data as called for on report formats 1921,-1,-2,-3. The data from which the format data is drawn is available in different data sets and used for other purposes.

b. The data as requested is not being used for estimating program and /or contract costs.

c. The data serves no other purpose that to satisfy DOD reporting needs.

d. Industry sees no value added by the preparation of the CCDR formats.

Regarding the report formats , the DODI 5000.2 gives the following reasons for providing these forms:
a. the 1921,1921-1 and 1921-2 formats will be used to provide actual costs and estimates to complete for each research and development and each production contract ;
b. the 1921 and1921-1 formats will be used to provide cost projections by fiscal year to complete the production program,and
c. the 1921-3 format will be used to provide plant-wide data.

CPR's and C/SSR's also provide actual cost and estimates to complete and they provide these data to the same WBS reporting elements required for reporting CCDR data. It appears that the CPR,CSSR and CFSR could provide this data in lieu of the CCDR 1921,1921-1 formats.The only data split missing is that between recurring and non-recurring. But, in most cases , this distinction can be easily made. The 1921-2 format should only be requested when the program is a true production program with multiple lot production ; and in this case Industry recommends that this data be the data used by Industry companies to derive their learning curve data rather than generate data to satisfy the 1921 format.

Industry also wonders why this data is required at any time other than the end of contract , if its use is to establish a data base for estimating follow-on or future acquisitions. It appears that any interim data would be subject to inaccuracies if used for this

purpose. The data necessary for other reporting purposes is contained in the normal data reported monthly on applicable contracts . Data required for DAES reports or DOD management summaries can be had more readily , and would be more timely, if pulled from reports like CPR's,CSSR's or CFSR's.

The 1921-3 format asks for data provided to the local DPRO's on a continual basis . Industry recommends that this indirect cost data be provided by the DPRO if for no other reasons than accuracy and timeliness.

Following are recommendations from Industry :

a. Eliminate 1921 formats and use CPR/CSSR and CFSR data for 1921 and 1921-1 requirements; request contractor learning curve data in lieu of 1921-2 format ; request indirect data from the DPRO in lieu of 1921-3 format.

b. If information must be provided on formats other than those noted above , provide Industry with the purpose and type of data required and ask Industry to develop a format that will satisfy DOD needs.

c. If separate formats must be provided for the purposes noted in the DOD 5000.2 , limit the reporting requirement to contract completion.

d. Eliminate the requirement to submit CCDR's in response to RFP's.

e.If the CCDR is used provide for higher reporting levels than used on the CPR.

f. Consider automated submission of CCDR's .

g.Update Performance Analyzer to add CCDR 1921 and 1921-1 report capability.

APPENDIX D

CCDR FORMATS AND DESCRIPTIONS

APPENDIX D

CCDR FORMATS AND DESCRIPTIONS

This appendix describes the format of the four basic reports of the CCDR system, the 1921, 1921-1, 1921-2, and 1921-3. A copy of the CCDR Plan format is included on page D-6. Starting on page D-8 are blank copies of the reports themselves. These copies were reproduced from the best copies available to us.

COST DATA SUMMARY REPORT (1921)

The 1921 report summarizes all activities included in the contract and aggregates costs against those work breakdown structure (WBS) elements specified in the contract (typically WBS level 3). The report contains costs by contract line item, contract WBS element for actual costs to date and to completion by recurring, non-recurring, and total as follows:

- Contract Line Item
  - Contract WBS Element
    - Actual Cost to Date
      - Recurring
      - Non-recurring
      - Total
    - Estimated Cost at Completion
      - Recurring
      - Non-recurring
      - Total
    - Number of Units at Completion

Overhead is included in the WBS element and is not separately broken out. The other categories of cost typically include general and administrative (G&A), profit or fee, and undistributed price, which are summarized at the total level only. The 1921 is usually required every six months during research and development and the first few years of

production and annually thereafter. The 1921 report is also used to provide contractor estimates by appropriation and fiscal year in response to requests for proposals (RFPs) and as required in the contract.

The 1921 reports can be used as a source of data for parametric estimating, analogous estimating, and estimating future contract costs for that particular program. For a given program, data can be compared among reports to identify trends and potential technical difficulties and cost growth on that contract and future contracts.

THE FUNCTIONAL COST-HOUR REPORT (1921-1)

The 1921-1 report summarizes major cost elements (e.g., direct labor costs and dollars, direct material overhead, G&A, and profit or fee) and hours by functional category (i.e., engineering, tooling, quality control, manufacturing, and other). Like the 1921 format, the 1921-1 shows actual cost, cost to completion, and total costs to date. The 1921-1 is obtained on selected WBS elements that require more detailed analysis such as for major cost drivers. The format also contains summary overhead data for ACAT II programs since the Plant-Wide Data Report (1921-3) is not required on these programs. The major reporting categories are as follows:

- Selected WBS Element
  - Recurring
    - -- Functional Category (Engineering, Tooling, Quality Control, and Tooling)
      - --- Major Cost Element and Hours (Direct Labor Hours and Cost, Material, and Overhead)
        - ---- Prime Contractor
          - ----- Actual Cost to Date
          - ----- Estimate at Completion
        - ---- Subcontractor
          - ----- Actual Cost to Date
          - ----- Estimate at Completion
        - ---- Total
          - ----- Actual Cost to Date
          - ----- Estimate at Completion
  - Non-recurring (same breakout as Recurring)

Like the 1921, the 1921-1 is usually required every six months during research and development (after prototyping begins) and during the first few years of production and annually thereafter.

Like the 1921 report, the 1921-1 report is also used to provide contractor program estimates by appropriation and fiscal year in response to RFPs and as specified in the contract.

The 1921-1 reports can be used to provide detailed data (both hours and dollars) on potential cost drivers that significantly affect future contract and program estimated costs. Like the 1921 report, the Functional Cost-Hour Report can be used to analyze potential technical difficulties and cost growth on that particular contract.

PROGRESS CURVE REPORT (1921-2)

The 1921-2 report provides recurring costs and hours for the manufacturing and quality control functions by lot or unit for major cost elements, (i.e., direct labor and direct material by type.) Costs are segregated by prime contractor, subcontractor, and total. The major reporting categories are:

- WBS Element
  - Prime Contractor
    - -- Direct Quality Control Hours and Costs
    - -- Direct Manufacturing Hours and Costs
    - -- Raw Material and Purchased Parts
    - -- Purchased Equipment
    - -- Total Costs
      - --- Actual by Units/Lots Accepted
      - --- Estimated for Next Unit/Lot To Be Accepted
      - --- Estimated To Complete Contract
  - Subcontractor (same breakout as Prime)
  - Total (same breakout as Prime and Subcontractor)
  - Manufacturing Flow Time (start and finish)

The 1921-2 is usually required every six months during research and development after prototyping begins and during the first few years of production and annually thereafter.

The Progress Curve Reports can be used to track actual and planned learning curve rates and for developing cost models. The data and models are particularly useful in assessing the cost effects of quantity changes. The report also shows actual and expected manufacturing flow time, which can be used to monitor schedule performance.

PLANT-WIDE DATA REPORT (1921-3)

The 1921-3 report is designed to provide information on indirect rates (overhead and G&A) for all business in the plant. There are three major sections. Section A shows direct costs for each program in the plant by direct cost base (engineering, manufacturing, material, and other) that are used for allocating overhead costs. Section B contains indirect costs by functional area and cost element (type or nature of the expense) and indirect employment. Data for these two sections are provided for the last 6 months, the last 12 months, the next 6 months, the next 12 months, and months 13 through 24. Section C shows labor rates and number of direct employees by functional area. Data are shown for each quarter of the current year. Rate data are furnished only for the prior and two succeeding years. The major reporting categories are:

- Plant-Wide
  - Direct Cost Business Base (by DoD program, other government, and commercial)
    - By Period (last 6 months, last 12 months, next 6 months, next 12 months, next 13-24 months)
      - By Functional Category (engineering, manufacturing, material, and other)
  - Indirect Cost Category (major elements of expense)
    - By Functional Category (engineering, manufacturing, material, other, and G&A)
  - Employment-Indirect (average number of employees)
    - Same breakout as for Indirect Cost Category
  - Direct Labor Rates by Function (engineering, tooling, quality control, and manufacturing)
    - By Period (each of last four quarters, past year, and each of next two years)
      - Number of Workers
      - Basic Average Plant-Wide Rate
      - Effective Average Plant-Wide Rate

The 1921-3 is required only on ACAT I programs and is provided on an annual basis. Only one report has to be prepared for the plant regardless of the number of programs within the plant.

The Plant-Wide Data Report can be used to develop cost models for estimating future overhead costs to include the fixed and variable breakout. The data are also valuable in assessing the cost effects of changes in the contractor's business base and for program quantity changes. The functional and cost element breakout also provides visibility into areas that are not always readily available to the cost analyst.

CONTRACTOR COST DATA REPORTING PLAN

1. PROGRAM: FX AIRCRAFT PROGRAM

2. (X) CAT I ( ) CAT II

3. (X) INITIAL SUBMISSION ( ) CHANGE REQUEST

6. (X) PROGRAM WBS ( ) CONTRACT WBS

5. DATA AS OF: 1/1/91X

6. REVIEW & REFERENCE NO.:

7. REPORT DATE: 1/1991X

8. PREPARED BY (ORGANIZATION NAME, OFFICE SYMBOL, ADDRESS): FX PROGRAM OFFICE, AFSPO, Wright Patterson Air Force Base, Dayton, Ohio 45433-6500

9. DATA STORAGE LOCATION: ASD/ACCR, BLDG XXX, WPAFB, OH 45433-6500

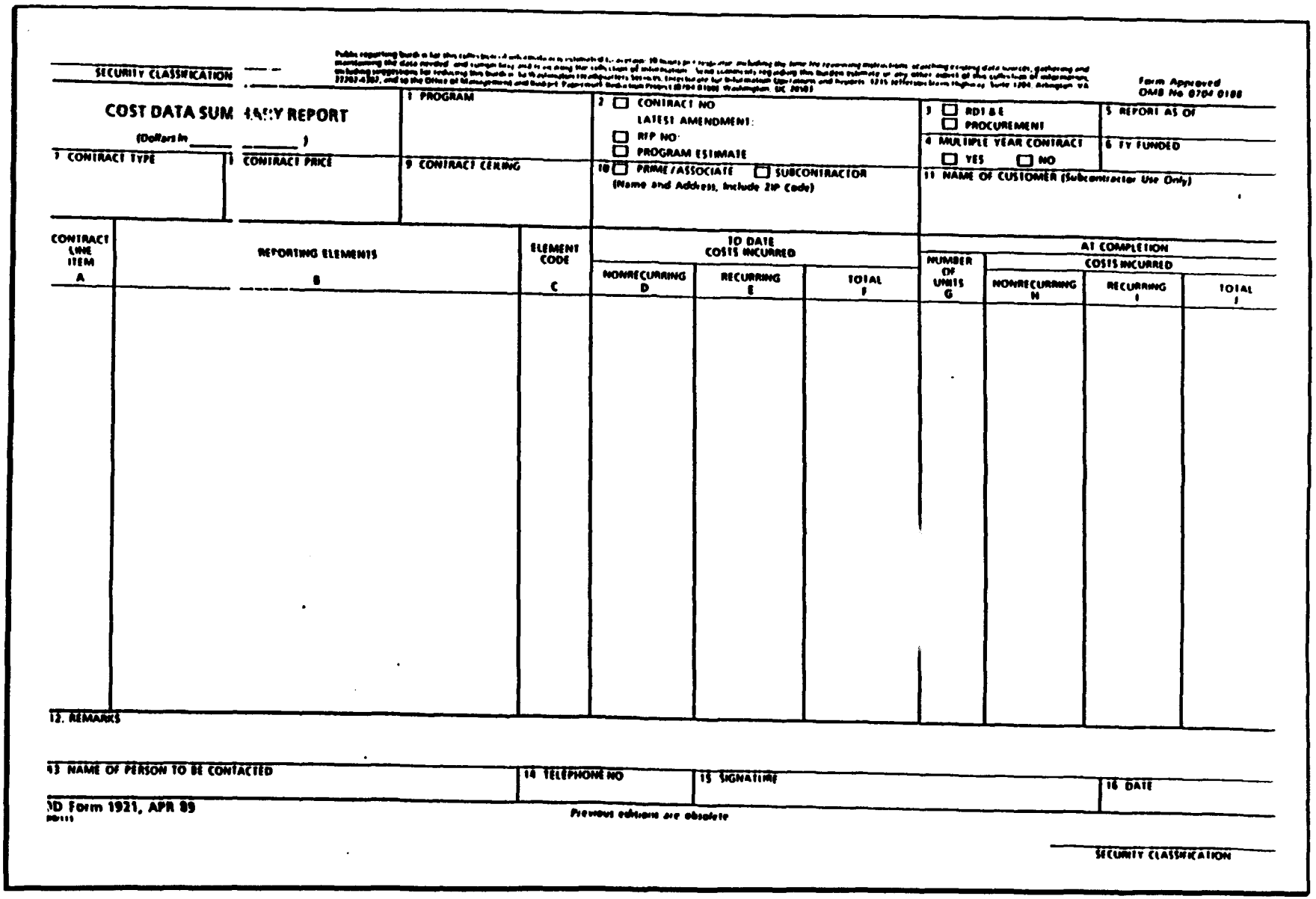
10. Line Number	11. WBS Level	12. REPORTING ELEMENTS	13. PROG CODE	14. Constraint	15. Contract Type	16. PROGRAM TOTALS — RDT&E — UNIT	RDT&E — COST ($Millions)	PROCUREMENT — UNITS	PROCUREMENT — COST ($Millions)	17. REPORT FREQUENCY — CCDR FORMS — DD FORM 1921 C	DD FORM 1921 P	DD FORM 1921-1 C	DD FORM 1921-1 P	DD 1921-2	DD 1921-3	CPSR	CPR/CSSR
1	1	FX AIRCRAFT		*	FPIF	20	3600	900	35000	SA	A/AR				A	Q	M
2	2	AIR VEHICLE					1705		26510	SA	A/AR						M
3	3	AIRFRAME					1000		12300	SA	A/AR	SA	A/AR	SA			M
4	4	WING								SA							M
5	4	FUSELAGE								SA							M
6	4	EMPENNAGE								SA							M
7	4	FLIGHT CONTROLS SUBSYSTEM								SA							M
8	4	HYDRAULIC SYSTEM								SA							M
9	4	ENVIRONMENTAL CONTROL								SA							M
10	4	CREW STATION SYSTEM								SA							M
11	4	LANDING AND ARRESTING GEAR SYSTEM								SA							M
12	4	INTEGRATION, ASSEMBLY, TEST AND CHECKOUT								SA							M
13	3	PROPULSION (FX-PW-220)			CPIF		425		9000	SA		SA		SA			M
14	3	COMMUNICATIONS/IDENTIFICATION					80		175	SA	A/AR						M
15	3	NAVIGATION/GUIDANCE					130		350	SA	A/AR						M
16	3	FIRE CONTROL			FPIF		125		3200	SA	A/AR	SA					M
17	4	RADAR								SA		SA		SA			M
18	4	COMPUTER								SA							M
19	4	CONTROLS AND DISPLAYS								SA							M
20	4	SYSTEM SOFTWARE								SA							M
21	3	AUTOMATIC FLIGHT CONTROL					90		200	SA	A/AR						M
22	3	CENTRAL COMPUTER			CPIF		50		1050	SA	A/AR	SA		SA			M
23	4	COMPUTER								SA							M
24	4	SYSTEM SOFTWARE								SA		SA					M
25	3	ELECTRONIC WARFARE					120		690	SA	A/AR						M
26	3	WEAPON DELIVERY EQUIPMENT					80		170	SA	A/AR						M
27	3	ARMAMENT					90		95	SA	A/AR						M
28	2	SYSTEM TEST AND EVALUATION					1184			SA		SA					M
29	3	DEVELOPMENT TEST AND EVALUATION								SA							M
30	4	WIND TUNNEL ARTICLES AND TEST								SA		SA					M
31	4	STATIC ARTICLES AND TEST								SA		SA					M
32	4	FATIGUE ARTICLES AND TEST								SA		SA					M
33	4	CONTRACTOR FLIGHT TESTS								SA		SA					M
34	3	OPERATIONAL TEST AND EVALUATION								SA							M
35	3	MOCKUPS								SA							M
36	2	TEST AND EVALUATION SUPPORT								SA							M
37	3	TEST FACILITIES								SA							M

10. PREPARED BY (NAME, GRADE, OFFICE SYMBOL, PHONE NUMBER, DATE)
Mr. John Doe, GS13, AFSPO/PM, Autovon 785-6000 1/1991X

11. COMMAND CONCURRENCE

12. SERVICE FOCAL POINT CONCURRENCE

13. CAIG APPROVAL DATE



SECURITY CLASSIFICATION

Public reporting burden for this collection of information is estimated to average 10 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

Form Approved
OMB No. 0704-0188

COST DATA SUMMARY REPORT

(Dollars in _____ _____)

1 PROGRAM	2 ☐ CONTRACT NO LATEST AMENDMENT: ☐ RFP NO ☐ PROGRAM ESTIMATE	3 ☐ RDT&E ☐ PROCUREMENT	5 REPORT AS OF
		4 MULTIPLE YEAR CONTRACT ☐ YES ☐ NO	6 FY FUNDED
7 CONTRACT TYPE	8 CONTRACT PRICE	9 CONTRACT CEILING	10 ☐ PRIME / ASSOCIATE ☐ SUBCONTRACTOR (Name and Address, Include ZIP Code)
			11 NAME OF CUSTOMER (Subcontractor Use Only)

CONTRACT LINE ITEM	REPORTING ELEMENTS	ELEMENT CODE	TO DATE COSTS INCURRED			AT COMPLETION			
						NUMBER OF UNITS	COSTS INCURRED		
A	B	C	NONRECURRING D	RECURRING E	TOTAL F	G	NONRECURRING H	RECURRING I	TOTAL J

12. REMARKS

13 NAME OF PERSON TO BE CONTACTED	14 TELEPHONE NO	15 SIGNATURE	16 DATE

DD Form 1921, APR 89
PD1111

Previous editions are obsolete

SECURITY CLASSIFICATION

SECURITY CLASSIFICATION

Form Approved
OMB No 0704-0188

FUNCTIONAL COST-HOUR REPORT

1. PROGRAM

2. REPORT AS OF

SECTION A

3. DOLLARS IN

4. HOURS IN

5. ☐ CONTRACT NO _____ ☐ RFP NO _____ LATEST AMENDMENT _____ ☐ PROGRAM ESTIMATE

6. ☐ NON-RECURRING ☐ RECURRING ☐ TOTAL

7. ☐ RDT&E ☐ PROCUREMENT ☐ OTHER

8. MULTIPLE YEAR CONTRACT ☐ YES ☐ NO

9. FY FUNDED

10. ☐ PRIME / ASSOCIATE ☐ SUBCONTRACTOR *(Name and address; include ZIP Code)*

11. NAME OF CUSTOMER *(Subcontractor Use Only)*

12. REPORTING ELEMENT

SECTION B

FUNCTIONAL CATEGORIES	ADJUSTMENTS TO PREVIOUS REPORTS A	CONTRACTOR TO DATE B	CONTRACTOR AT COMPL. C	SUBCONTRACT OR OUTSIDE PRODUCTION AND SERVICES TO DATE D	SUBCONTRACT OR OUTSIDE PRODUCTION AND SERVICES AT COMPL. E	TOTAL TO DATE F	TOTAL AT COMPL G
ENGINEERING							
1 DIRECT LABOR HOURS							
2. DIRECT LABOR DOLLARS	$	$	$	$	$	$	$
3. OVERHEAD	$	$	$	$	$	$	$
4 MATERIAL	$	$	$	$	$	$	$
5 OTHER DIRECT CHARGES *(Specify)*	$	$	$	$	$	$	$
6 TOTAL ENGINEERING DOLLARS	$	$	$	$	$	$	$
TOOLING							
7 DIRECT LABOR HOURS							
8 DIRECT LABOR DOLLARS	$	$	$	$	$	$	$
9. OVERHEAD	$	$	$	$	$	$	$
10 MATERIALS AND PURCHASED TOOLS	$	$	$	$	$	$	$
11 OTHER DIRECT CHARGES *(Specify)*	$	$	$	$	$	$	$
12 TOTAL TOOLING DOLLARS	$	$	$	$	$	$	$
QUALITY CONTROL							
13 DIRECT LABOR HOURS							
14 DIRECT LABOR DOLLARS	$	$	$	$	$	$	$
15 OVERHEAD	$	$	$	$	$	$	$
16 OTHER DIRECT CHARGES *(Specify)*	$	$	$	$	$	$	$
17 TOTAL QUALITY CONTROL DOLLARS	$	$	$	$	$	$	$
MANUFACTURING							
18 DIRECT LABOR HOURS							
19 DIRECT LABOR DOLLARS	$	$	$	$	$	$	$
20 OVERHEAD	$	$	$	$	$	$	$
21 MATERIALS AND PURCHASED PARTS	$	$	$	$	$	$	$
22 OTHER DIRECT CHARGES *(Specify)*	$	$	$	$	$	$	$
23 TOTAL MANUFACTURING DOLLARS	$	$	$	$	$	$	$
24 PURCHASED EQUIPMENT	$	$	$	$	$	$	$
25 MATERIAL OVERHEAD	$	$	$	$	$	$	$
26 OTHER COSTS NOT SHOWN ELSEWHERE *(Specify)*	$	$	$	$	$	$	$
27 TOTAL COST LESS G & A	$	$	$	$	$	$	$
28 G & A	$			$	$	$	$
29 TOTAL COST PLUS G & A	$			$	$	$	$
30 FEE OR PROFIT	$			$	$	$	$
31 TOTAL OF LINES 29 AND 30	$			$	$	$	$

FORM CONTINUED ON PAGE 2

SECURITY CLASSIFICATION

SECURITY CLASSIFICATION

SECTION II ONLY

DIRECT LABOR HOURS INCURRED THIS REPORT PERIOD

	ENGINEERING A	TOOLING B	QUALITY CONTROL C	MANUFACTURING D
1 TOTAL BEGINNING OF REPORT PERIOD				
2				
3				
4				
5				
6 TOTAL END OF REPORT PERIOD				

SECTION II ONLY

PLANT-WIDE LABOR AND OVERHEAD INFORMATION

	1. DIRECT LABOR			2. PLTWIDE OH		1. DIRECT LABOR			2. PLTWIDE OH		1. DIRECT LABOR			2. PLTWIDE OH	
	WORK A	BASIC RATE B	EFF RATE C	IND WORK D	RATE E	WORK F	BASIC RATE G	EFF RATE H	IND WORK I	RATE K	WORK L	BASIC RATE M	EFF RATE N	IND WORK P	RATE Q
1 ENGINEERING															
2 TOOLING															
A DESIGN															
B FABRICATION															
3 QUALITY CONTROL															
4 MANUFACTURING															
5 MATERIAL															
6 G&A															

SECTION II ONLY

	1. DIRECT LABOR			2. PLTWIDE OH		1. DIRECT LABOR			2. PLTWIDE OH		1. DIRECT LABOR			2. PLTWIDE OH	
	WORK A	BASIC RATE B	EFF RATE C	IND WORK D	RATE E	WORK F	BASIC RATE G	EFF RATE H	IND WORK I	RATE K	WORK L	BASIC RATE M	EFF RATE N	IND WORK P	RATE Q
1 ENGINEERING															
2 TOOLING															
A DESIGN															
B FABRICATION															
3 QUALITY CONTROL															
4 MANUFACTURING															
5 MATERIAL															
6 G&A															

REMARKS

NAME OF PERSON TO BE CONTACTED	PHONE NO.	SIGNATURE	DATE

DD Form 1921-1, APR 89

SECURITY CLASSIFICATION

SECURITY CLASSIFICATION

Form Approved
OMB No. 0704-0188

SECTION A

PROGRESS CURVE REPORT
(Recurring Cost Only)

1 PROGRAM

2 DOLLARS IN

3 HOURS IN

4 TOTAL CUMULATIVE UNITS ACCEPTED AS OF LAST REPORT

5 CONTRACT NO.

6 REPORT FOR _____ MONTHS
ENDING _____

7 MULTIPLE YEAR CONTRACT ☐ YES ☐ NO

8 EV FUNDED

9 ☐ PRIME / ASSOCIATE ☐ SUBCONTRACTOR
(Name and address; include ZIP Code)

10 NAME OF CUSTOMER *(Subcontractor Use Only)*

11 REPORTING ELEMENT

SECTION B

ITEM	UNITS / LOTS ACCEPTED SPECIFY: UNIT / LOT TOTAL ☐ OR UNIT / LOT AVERAGE ☐ A	B	C	D	E	ESTIMATE OF NEXT UNIT / LOT TO BE ACCEPTED F	TO COMPLETE CONTRACT G
1 MODEL AND SERIES							
2 FIRST UNIT OF LOT							
3 LAST UNIT OF LOT							
4 CONCURRENT UNITS							
CHARACTERISTICS 5. 6 7							
CONTRACTOR DATA *(Per Unit / Lot)*							
8 DIRECT QUALITY CONTROL LABOR HOURS							
9 DIRECT MANUFACTURING LABOR HOURS							
10 QUALITY CONTROL DIRECT LABOR DOLLARS	$	$	$	$	$	$	$
11 MANUFACTURING DIRECT LABOR DOLLARS	$	$	$	$	$	$	$
12 RAW MATERIAL & PURCHASED PARTS DOLLARS	$	$	$	$	$	$	$
13 PURCHASED EQUIPMENT DOLLARS	$	$	$	$	$	$	$
14 TOTAL DOLLARS	$	$	$	$	$	$	$
SUBCONTRACT / OUTSIDE PROD. & SERV							
15 DIRECT QUALITY CONTROL LABOR HOURS							
16 DIRECT MANUFACTURING LABOR HOURS							
17 TOTAL LABOR HOURS							
18 QUALITY CONTROL DIRECT LABOR DOLLARS	$	$	$	$	$	$	$
19 MANUFACTURING DIRECT LABOR DOLLARS	$	$	$	$	$	$	$
20 RAW MATERIAL & PURCHASED PARTS DOLLARS	$	$	$	$	$	$	$
21 PURCHASED EQUIPMENT DOLLARS	$	$	$	$	$	$	$
22 TOTAL DOLLARS	$	$	$	$	$	$	$
TOTAL PER UNIT / LOT							
23 DIRECT QUALITY CONTROL LABOR HOURS							
24 DIRECT MANUFACTURING LABOR HOURS							
25 TOTAL LABOR HOURS							
26 QUALITY CONTROL DIRECT LABOR DOLLARS	$	$	$	$	$	$	$
27 MANUFACTURING DIRECT LABOR DOLLARS	$	$	$	$	$	$	$
28 RAW MATERIAL & PURCHASED PARTS DOLLARS	$	$	$	$	$	$	$
29 PURCHASED EQUIPMENT DOLLARS	$	$	$	$	$	$	$
30 TOTAL DOLLARS	$	$	$	$	$	$	$
31 % SUBCONTRACT OR OUTSIDE PROD & SERV							

SECTION B CONTINUED ON PAGE 2

SECURITY CLASSIFICATION

SECURITY CLASSIFICATION

	ITEM	UNITS / LOTS ACCEPTED A	B	C	D	E	ESTIMATE OF NEXT UNIT / LOT TO BE ACCEPTED F	TO COMPLETE CONTRACT G
SECTION B MOS OR OTRS	MFG FLOW TIME							
	32 START							
	33 FINISH							
	34							
	35							
	36							
	37							
	38							
	39							
SECTION C	PERFORMANCE DATA (Per Unit / Lot)							
	40 STANDARD HOURS							
	41 VARIANCE							

CAT II	SCHEDULE OF RELEASE DATES	ENGINEERING A	MATERIAL B	TOOLING C	MANUFACTURING D
	1 PLANNED				
	2 ACTUAL				

REMARKS

NAME OF PERSON TO BE CONTACTED	PHONE NO.	SIGNATURE	DATE

DD Form 1921-2, APR 89

Page 2 of 2 Pages

SECURITY CLASSIFICATION

SECURITY CLASSIFICATION

Form Approved
OMB No 0704-0188

PLANT - WIDE DATA REPORT

(Dollars in _____)

A. CONTRACTOR

B. PLANT LOCATION

C. DATE SUBMITTED

OVERHEAD ACCUMULATION, DISTRIBUTION AND APPLICATION

SECTION A

TIME PERIOD			(1) FROM ... TO				(2) ☐ ACTUAL ☐ ESTIMATE FROM ... TO				(3) FROM ... TO				(4) FROM ... TO				(5) FROM ... TO			
PROGRAM/ PROJECT a	QTY b	BUYER c	DIRECT COST ENG d	MFG e	MAT'L f	OTHER g	DIRECT COST ENG d	MFG e	MAT'L f	OTHER g	DIRECT COST ENG d	MFG e	MAT'L f	OTHER g	DIRECT COST ENG d	MFG e	MAT'L f	OTHER g	DIRECT COST ENG d	MFG e	MAT'L f	OTHER g
1																						
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12 OTHER GOVT. EFFORT																						
13 COMMERCIAL EFFORT																						
14 TOTAL DIRECT COST BASE																						

SECTION B

INDIRECT COST CATEGORY	(1) FROM ... TO					(2) FROM ... TO					(3) FROM ... TO					(4) FROM ... TO					(5) FROM ... TO				
	ENG h	MFG i	MAT'L j	OTHER k	G&A l	ENG h	MFG i	MAT'L j	OTHER k	G&A l	ENG h	MFG i	MAT'L j	OTHER k	G&A l	ENG h	MFG i	MAT'L j	OTHER k	G&A l	ENG h	MFG i	MAT'L j	OTHER k	G&A l
15 INDIRECT LABOR																										
16 EMPLOYEE BENEFITS																										
17 PAYROLL TAXES																										
18 EMPLOYMENT																										
19 COMMUNICATION/ TRAVEL																										
20 PRODUCTION RELATED																										
21 FACILITIES-BUILDING/LAND																										
22 FACILITIES-FURNITURE/EQ																										
23 ADMINISTRATION																										
24 FUTURE BUSINESS																										
25 OTHER MISCELLANEOUS																										
26 CREDITS																										
27 TOTAL OVERHEAD COST																										
28 TOTAL G&A COST																										
29 OVERHEAD/G&A RATE																										
EMPLOYMENT - INDIRECT																										
30 WORKERS (end of month)																										

DD Form 1921-3, APR 89

Previous editions are obsolete.

Page 1 of 2 Pages

SECURITY CLASSIFICATION

SECURITY CLASSIFICATION

DIRECT LABOR RATES

SECTION C	CURRENT YEAR												PAST YEAR	YEAR:	YEAR:
	1ST QUARTER			2ND QUARTER			3RD QUARTER			4TH QUARTER					
	WORKERS a	BASIC RATE b	EFF. RATE c	WORKERS a	BASIC RATE b	EFF. RATE c	WORKERS a	BASIC RATE b	EFF. RATE c	WORKERS a	BASIC RATE b	EFF. RATE c	BASIC RATE b	BASIC RATE b	BASIC RATE b
1. ENGINEERING															
2. TOOLING															
a. DESIGN															
b. FABRICATION															
3. QUALITY CONTROL															
4. MANUFACTURING															

REMARKS

NAME OF PERSON TO BE CONTACTED | PHONE NO. | SIGNATURE | DATE

DD Form 1921-3, APR 89

SECURITY CLASSIFICATION

APPENDIX E

OTHER COST COLLECTION SYSTEMS

APPENDIX E

OTHER COST COLLECTION SYSTEMS

COST PERFORMANCE REPORT (CPR)

The CPR is generally required on all major contracts that require C/SCSC compliance except firm-fixed-price. Major contracts are research and development contracts of $60 million or more and production contracts of $250 million or more. These thresholds are expressed in FY1990 constant dollars. Reporting frequency is usually monthly [7].

The primary focus of the CPR is to measure earned value on a particular contract. Earned value compares the budgeted cost of work performed (BCWP) with the actual cost of work performed (ACWP). If ACWP exceeds BCWP, there is a negative, unfavorable cost variance. Conversely, if BCWP exceeds ACWP, there is a positive, favorable cost variance. A secondary measure is the schedule variance, which compares the budgeted cost of work scheduled (BCWS) to BCWP. If BCWS exceeds BCWP, there is a negative, unfavorable schedule variance. If BCWP exceeds BCWS, there is a positive, favorable schedule variance.

The CPR data are particularly useful in estimating costs at completion for one particular contract. The portion of the CPR that deals with actual costs could also be useful for estimating future contract costs, for estimating by analogy, and for parametric estimating.

The CPR consists of five major formats [27]:

1—Cost Performance Report-Work Breakdown Structure

2—Cost Performance Report-Functional Categories

3—Cost Performance Report-Baseline

4—Cost Performance Report-Manpower Loading

5—Cost Performance Report-Problem Analysis

Format 1 reports budgeted cost of work scheduled, budgeted cost of work performed, and actual cost of work performed generally at level 3 of the contract WBS.

Reporting below level 3 should be required only an exception basis where there is very high interest and need for cost estimating. The CPR provides reporting for the current period (normally a month) and for cumulative-to-date data.

Format 2 reports performance in terms of major functional or organizational categories so that variances can be analyzed by the functional unit involved in the performance of the work. Normally, the functional elements apply to the total contract and not to a specific WBS elements.

Format 3 is essentially a worksheet for tracking changes to the performance measurement baseline. These changes typically result from contract change orders, use of management reserves, and internal replanning actions. Maintaining the appropriate performance baseline is key to measuring earned value and estimating contract costs at completion.

Format 4 provides manpower loading projections for the Format 2 functional categories. Manloading is usually key to the planning process and ordinarily provides a direct correlation between manpower and cost projections.

Format 5 requires a problem analysis narrative that explains significant cost and schedule variances, use of management reserve and other internal replanning activities, and over-target baseline.

We were most interested in Formats 1 and 2 because they relate directly to the 1921 and 1921-1 CCDR formats, respectively. Specifically, they contain actual and projected contract cost data in similar categories to the 1921 and 1921-1 reports. The CPR does not have any formats that provide data similar to those reported on the 1921-2 and 1921-3 reports.

COST/SCHEDULE STATUS REPORT (C/SSR)

The C/SSR provides summarized cost and schedule performance information on contracts where CPR application is not appropriate. The C/SSR is used for contracts of $5 million (in constant FY 1990 dollars) or more with a duration of over 12 months. Firm-fixed-price contracts are generally excluded from reporting [18].

The C/SSR has only one format [28] and the data reported are similar to CPR Format 1, Cost Performance Report-Work Breakdown Structure. The primary difference is that cost and variance data are shown for the cumulative-to-date period only. The C/SSR also does not contain the cost of money or the reconciliation to contract budget base. Reporting frequency is not specified but should not exceed monthly submissions [18].

Like the CPR, the C/SSR is useful for estimating the cost of a particular contract.

CONTRACT FUNDS STATUS (CFSR)

The CFSR is designed to provide funding data on individual contracts to help in budgeting and managing funding. The CFSR applies to contracts over $1,000,000 (in constant FY 1990 dollars) and more than six months in duration it does not normally apply to firm-fixed-price contracts [18].

The CFSR consists of two major sections [29]. The first section, Funding Information, captures funding, combined accrued expenditures and commitments, authorized and forecasted contract work by contract line item or WBS element and related appropriation and fiscal year. The second section, Contract Work Authorized-Actual or Projected, contains contract totals without regard to line items or appropriations. Actual dollars to date and projections to contract completion are shown separately for open commitments, accrued expenditures, forecasted billings to the government, and estimated termination liability.

The CFSR is primarily a planning, budgeting, and budget execution document. The report is not used in estimating costs per se but can be used with other contractor cost projections to help in determining the cost breakout by fiscal year for budget purposes.

FORWARD PRICING RATE AGREEMENTS (FPRA)

An FPRA [26] is a written agreement negotiated between the government and its contractor to use certain rates and factors during a specified period to price contracts and contract modifications. FPRAs generally apply to the current fiscal year and two succeeding fiscal years, although the length may vary according to the contractor's individual circumstances. Typically, these costs cannot easily be estimated or identified to a specific contract or end item such as indirect costs and rates, labor rates, material obsolescence and usage, and material handling.

The Administrative Contracting Officer (ACO) and the Defense Contract Audit Agency are responsible for monitoring the rates and actual costs incurred to determine if and when the FPRA should be revised. For planning and estimating purposes, the FPRA represents the most current information available.

Our interest in FPRAs focused on indirect costs because many of the data elements collected and reviewed were similar, if not identical, to the data captured on the Plant-Wide Data Report (1921-3). FPRAs should reflect the most current and accurate information

available given the written agreement and the ongoing oversight by DoD and the contractor. The 1921-3 was originally developed to provide a common overhead structure in lieu of the many different formats employed by the various contracting offices. In addition, the 1921-3 is a summary report, while the FPRA contains more detailed data.

SELECTED ACQUISITION REPORT (SAR)

The SAR was originally developed to provide the Secretary of Defense with a standard, comprehensive, summary report of the status of major acquisition programs. The report summarizes the key cost, schedule, and technical status of each major system (ACAT I) and the variance analysis from the SAR baseline. In 1975, the SAR became a legal reporting document to the Congress. The comprehensive SAR is an annual reporting requirement. Abbreviated exception reporting is required on a quarterly basis when thresholds for cost, schedule, or performance baselines are breached.

The SAR contains the following 19 reporting sections [18]:

1–5—Cover Sheet (System name, component, program element/appropriation data, and related programs)

6—Mission Description

7—Program Highlights

8—Threshold Breaches

9—Schedule

10—Performance

11—Program Acquisition Cost

12—Program Acquisition/Current Procurement Unit Cost Summary

13—Cost Variance Analysis

14—Program Acquisition Unit Cost History

15—Contract Information

16—Program Funding Summary

17—Production Rate Data

18—Operating and Support Costs

19—Cost/Quantity Information—Addendum (for DoD use only)

All but Section 19, Cost/Quantity Information, are reported to Congress. Section 19 is used for internal DoD purposes only.

The focus of the SAR is on establishing, tracking, and revising as necessary the cost, schedule, and technical estimates at the program level. The technical data may be useful in establishing independent variables for both cost and schedule estimating. The data are generally not useful for cost estimating below the program level.

In addition, the SAR does not generally show actual costs incurred to date. For example, Section 11, Program Acquisition Cost, shows the cost estimate at level 3 of the program WBS for the last milestone estimate, the approved program, and the current estimate. Cumulative actual costs are not shown.

Cost information at the contract level is limited. Specifically, Section 15, Contract Information, summarizes contract data (by major contractor and contract) to include target and ceiling prices, contractor and program manager estimates at completion, and performance data consisting of cumulative cost and schedule variances. Neither actual costs or cost data are shown below the contract level. The only actual cost data shown in the SAR are in Section 16, Program Funding Summary. Actual government accounting expenses are shown by fiscal year and appropriation but are of little value for cost-estimating purposes.

Section 19, Cost/Quantity Information, may include some actual costs by major end item with the recurring and non-recurring breakout. These data are useful for estimating program costs.

DEFENSE ACQUISITION EXECUTIVE SUMMARY (DAES)

The DAES is an internal DoD reporting system designed to provide acquisition managers and executives with early warning of potentially significant program problems to support timely resolution. The DAES is a quarterly reporting requirement that applies to all ACAT I programs. Information shown in the DAES should be consistent with other approved program documentation, including the SAR.

The DAES consists of a cover sheet and eight reporting sections [18], as follows:

1—Executive Summary

2—Assessments

3—Program Manager Comments

4—PEO and CAE Comments

5—Approved Program Data

6—Program Background Data

7—Supplemental Contract Cost Information

8—Annual POM/BES Program Funding Summary

Data that are specifically useful for cost-estimating purposes can be found in Sections 5, 6, and 7. Section 5 contains program performance characteristics, schedule milestones, and program acquisition cost by initial and approved program objective/threshold. Acquisition cost is further subdivided into development, procurement, Military Construction, and acquisition Operations and Management. Section 6 includes procurement delivery information and the program manager's current estimate at completion for all program costs by contracts and non-contracts (government in-house). Large active contracts are separately identified and reported.

Section 7 summarizes contract, schedule, and performance data. Contract and schedule data are provided for those major contracts in Section 6. Performance data applies to those contracts requiring a CPR or C/SSR. For those contracts that do not have performance data (e.g., firm-fixed-price), the program manager provides a best estimate at completion. Contract identification data includes number, type, program phase, negotiated price, target price, and ceiling price.

Contract schedule data include the estimated completion dates for the two contract critical milestones, significant effort completion date, and contract completion date.

Cost performance data are summarized at the total contract level based on the CPR and C/SSR (i.e., BCWS, BCWP, and ACWP). There are no breakouts for WBS elements, functional elements, or cost elements.

APPENDIX F

FREQUENCY OF USE OF CCDR DATA

Table F-1. Use of CCDR Data by Cost Analysis Organizations to Prepare Estimates

Organization using data[b]	Rate of data use[a]						
	Prepare POE for CAIG/DAB review	Prepare CCA for CAIG/DAB review	Prepare CCP for CAIG/DAB review	Prepare other estimates for CAIG/DAB review	Prepare estimates for price analyses and contract negotiations: Before receipt of proposal	Prepare estimates for price analyses and contract negotiations: After receipt of proposal	Track contractor negotiated costs
Cost Centers							
CEAC	—	1	—	1	0	0	1
NCA	—	1	—	1	1	1	0
SAF/FMC and AFCAA	—	1	1	—	0	0	0
Commodity Commands							
Army							
ATCOM	1	—	—	—	2	2	—
MICOM	3	—	—	3	0	0	0
SSDC	—	2	—	—	1	1	0
Navy							
NAVAIR							
0	2	—	2	—	2	2	0
I	3	—	3	—	3	3	2
II	3	—	3	—	3	3	2
III	3	—	3	—	3	3	2
NAVSEA[c]							
0	0/0	—	0/0	0/0	0/0	0/0	0/0
I	2/0	—	2/0	0/0	1/0	0/0	1/1
II	1/0	—	1/0	0/0	1/0	0/0	1/1
III	1/0	—	1/0	0/0	1/0	0/0	0/0
Air Force							
ASC	1	—	—	1	1	1	0
SMC	1	—	—	1	0	0	0
BMDO	1	—	—	1	1	1	0
Program Offices							
Army							
Comanche						3	
0	2	—	—	2	2		1
I	2	—	—	2	2		1
II	3	—	—	3	3		2
III	—	—	—	—	—		—
Hellfire					0	0	0
0	2	—	—	2			
I	2	—	—	2			
II	2	—	—	2			
III	—	—	—	—			
Navy							
F/A-18 and Air-to-Air	1	—	—	1	1	2	0
Air Force							
B-2	0	—	—	0	0	0	0
F-16	0	—	—	0	0	0	0

[a] A dash (—) means that no rate was given; 0 means that data were not used at all; 1, that data were used occasionally, but not frequently; 2, that data were used moderately; and 3, that data were used extensively.

[b] For NAVSEA and NAVAIR, rates were reported individually for Milestones 0 through III. For the other organizations, rates apply to the organizations' use of data during any milestone.

[c] NAVSEA reported different rates for missiles and ships, respectively.

Table F-2. Use of CCDR Data by Cost Analysis Organizations to Develop Estimating Relationships

Organization using data	Rate of data use[a,b]									
	Any WBS Level		WBS Level 1		WBS Level 2		WBS Level 3		WBS Level 4 and below	
	In	Out	In	Out	In	Out	In	Out	In	Out
Cost Centers										
CEAC	—	—	1	3	1	3	1	3	1	3
NCA	1	1	—	—	—	—	—	—	—	—
SAF/FMC and AFCAA	1	1	—	—	—	—	—	—	—	—
Commodity Commands										
Army										
ATCOM	1	1	—	—	—	—	—	—	—	—
MICOM	3	1	—	—	—	—	—	—	—	—
SSDC	2	1	—	—	—	—	—	—	—	—
Navy										
NAVAIR	—	—	1	1	2	2	3	3	3	3
NAVSEA[c]	—	—	1/0	0/0	2/0	0/0	1/0	0/0	0/0	0/0
Air Force										
ASC	1	1	—	—	—	—	—	—	—	—
SMC	0	1	—	—	—	—	—	—	—	—
BMDO	0	1	—	—	—	—	—	—	—	—
Program Offices										
Army										
Comanche	—	—	1	0	2	0	2	0	2	0
Hellfire	2	1	—	—	—	—	—	—	—	—
Navy										
F/A-18 and Air-to-Air	1	0	—	—	—	—	—	—	—	—
Air Force										
B-2	—	—	0	0	0	0	0	0	0	0
F-16	0	0	—	—	—	—	—	—	—	—

[a] A dash (—) means that no rate was reported; 0 means that data were not used at all; 1, that data were used occasionally but not frequently; 2, that data were used moderately; and 3, that data were used extensively.

[b] "In" means that the work was done in-house; "Out" means that the work was contracted out.

[c] NAVSEA reported different rates for missiles and ships, respectively.

APPENDIX G

USE OF CCDR DATA IN COST RESEARCH

Table G-1. CCDR-Related Listings in Cost Research Catalogs Associated with IDA Cost Research Symposia, 1989-1993

IDA Catalog	Project No.	Title
1989 [34]	JM-06	Aircraft Cost Data Base Update
	MF-01	Aircraft System Data Base (ASDB)
	SD-07	Contractor Cost Data Management System (CCDMS)
	EL-08	Use of Contractor Cost Data Reports (CCDR) in Cost Estimating
1990 [33]	CEAC-3	Aircraft System Data Base (ASDB)
	AVSCOM-3	Use of Contractor Cost Data Reports (CCDR) in Cost Estimating
	AFCSTC-4	Contractor Cost Data Management System (CCDMS)
1991 [32]	NCA-10	General Cost Estimating Relationships (CERs) for Estimating Recurring Airframe Cost
1992 [31]	CEAC-1	USACEAC Standard Acquisition Data Base Architecture
	CEAC-4	Missile Module of USACEAC Standard Data Base Architecture
	NCA-3	Impact of Reduced Business Base on Overhead Rates
1993 [30]	CEAC-1	USACEAC Standard Acquisition Data Base Architecture
	CEAC-2	Aircraft Data Base and Methodology Enhancement
	CEAC-10	Develop CERs for Wheeled and Tracked Combat Vehicles
	NCA-13	Avionics FAIT Labor to Materials Factors
	NCA-15	Impact of Reduced Business Base on Overhead Rates
	NAVSEA-5	Functional Requirements Analysis for Program Cost Database
	AFESC-2	PC ACDB (Automated Cost Data Base) Linked to Cost Analysis Statistical Package (COSTAT)
	IDA-2	Assessment of CCDR System

Note: Numbers in brackets correspond to citation numbers in the list of references, located at the back of this paper.

Table G-2. CCDR Resource Tools Found in the Air Force Cost Analysis Resource References System (CARRS)

Title	Record #	Developer	Focal Point
1. Automated Data Base for Acquisition of Missiles (ADAM)	2A0008	Tecelote Research	USACEAC
2. Contractor Cost Data base and Statistical Analysis[a]	2A0009	Army Aviation Systems Command (AVSCOM)	AVSCOM
3. Aircraft Systems Data Base	2A014	RJO Enterprises	USACEAC
4. The RAND Airframe Data Base	2B0003	RAND	RAND
5. Sonar Data Base	2N0006	NCA	NCA
6. Radar Data Base	2N0007	NCA	NCA
7. Military Aircraft Development Data Base[a]	2N0028	Not shown	NCA

[a] Includes database and statistical analysis.

APPENDIX H

PROPOSED OVERHEAD STRUCTURE

APPENDIX H

PROPOSED OVERHEAD STRUCTURE

IDA OVERHEAD STUDIES

During the 1980s, IDA completed overhead studies on twelve major contractors (seven aircraft manufacturers, two engine companies, one missile company, one electronics company, and one tracked vehicle company). The purpose of the data was to collect cost (direct and indirect) and related data (e.g., employment data, capital investments, etc.) that could be used to estimate future overhead costs, including the fixed and variable cost mix. We developed a common overhead cost structure to collect detailed cost data and found the structure to be generally compatible with contractors' accounting systems.

We have recently completed some minor revisions to that structure to update the data through 1993 for five of the original twelve contractors and to collect new data for six private shipyards. Some of the data changes were related to input from various cost analysts who noted that certain overhead cost elements have become significant cost drivers over time. For example, worker compensation costs have had dramatic effects on shipyard overhead costs. Medical benefits have also become important drivers as medical costs escalate faster than other fringe benefits such as salaries and wages. Environmental requirements and related costs have also risen significantly in recent years. The CCDR system does not presently collect such data or allow for its collection in the future.

The overhead studies also demonstrated that direct labor dollars, number of employees (direct, indirect, and total), and net book value of capital assets (also referred to as capital stock) are important variables in statistical models to estimate fixed, variable, and total overhead costs. We noted that the 1921-3 captures needed direct labor costs and employment data to support the statistical models. However, data on capital stock (net book value) are not reported and should be included in any future revision to the 1921-3.

PROPOSED FORMAT CHANGES

Table H-1 summarizes the indirect cost categories for the current CCDR report and the proposed IDA cost categories by showing:

- the indirect cost categories as reflected in the 1921-3, Section B,
- where the 1921-3 data appear in the proposed IDA structure, and
- the proposed IDA cost categories for 1921-3.

The italicized cost categories indicate that the data are being reported at that level. The cost categories shown under those levels describe the detailed contents of the categories being reported but are not reported separately. For example, the first category representing indirect labor is reported in total only. The detailed cost elements (types of cost) below that level (such as salaries/wages, supplemental wages, etc.) are included in that total and are not individually reported.

The IDA structure also has five cost elements below the cost category level (i.e., employee health insurance, worker compensation, bid and proposal, independent research and development, and environmental costs), which should be reported as non-added items. These five items are italicized to indicate required reporting and placed in parenthesis to show their non-add status. The cost categories to which they relate should reflect total costs.

The present CCDR functional cost categories of engineering, manufacturing, material, other, and general and administrative (G&A) remain the same. In addition, the cost of facilities capital (average net book value of capital assets) should be shown for the fiscal year being reported (actuals) and for the succeeding two fiscal years (estimated).

Table H-1. Indirect Cost Structure

1921-3	Relationship to IDA Structure	IDA Cost Structure
Indirect Labor	Same - all in *Indirect Labor*	*Indirect labor*
Salaries/Wages		Salaries/Wages
Supplemental Allowances		Supplemental Allowances
Apprentice and OJT		Apprentice and OJT
Administration and Supervision		Administration and Supervision
Other (Indirect Labor)		Other Indirect Labor
Employee Benefits	*Fringe Benefits*	*Fringe Benefits*
Paid Absences	In *Fringe Benefits*	Paid Absences
Employee Insurance	Subdivided into:	
	Employee Health Insurance	*(Employee Health Insurance)*
	Other Employee Insurance	Other Employee Insurance
Savings-Retirement Plans	In *Fringe Benefits*	Savings-Retirement Plans
Education	In *Other Expenses*	
Other Benefits	In *Fringe Benefits*	Other Fringe Benefits
Payroll Taxes	All in *Fringe Benefits*	
FICA		FICA
Federal and State Unemployment		Federal and State Unemployment
Composite payroll taxes		Composite payroll taxes
Other (Payroll Taxes)	In *Fringe Benefits* but subdivided into:	
	Worker Compensation and	*(Worker Compensation)*
	Other Payroll Taxes	Other Payroll Taxes
Employment	All in *Other Expenses*	
Employee Advertising		
Recruitment Travel		
Employee Relocation		
Composite Employment		
Other (Employment)		

Table H-1. Indirect Cost Structure (continued)

1921-3	Relationship to IDA Structure	IDA Cost Structure
Communication/Travel	Subdivided as follows:	
Telephone and Telegraph	In *Other Expense*	
Postage	In *Other Expense*	
Travel	In *Other Expense*	
Corporate Aircraft	In *Corporate Office Allocations*	
Other (Communication/Travel)	In *Other Expense*	
Production Related	All in *Other Expenses*	
Expendable Tools and Equipment		
Freight		
Material Handling		
Manufacturing Supplies/Services		
Product Servicing		
Tool Handling		
Medical Services		
Other (Production Related)		
Facilities-Building/Land	All in *Facilities Related*	*Facilities Related* (Includes buildings, furniture, and equipment except information technology equipment)
Depreciation and Amortization		Depreciation and Amortization
Rentals		Rentals
Maintenance		Maintenance
Insurance		Insurance
Utilities		Utilities
Property Taxes		Property Taxes
Plant Rearrangement		Plant Rearrangement
Plant Security		Plant Security
Other (Facilities-Building/Land		Other Facilities Related

Table H-1. Indirect Cost Structure (continued)

1921-3	Relationship to IDA Structure	IDA Cost Structure
Facilities-Furniture/Equipment	Subdivided into *Facilities Related* and *Information Technology*	*Information Technology* (Includes hardware, software and related telecommunications equipment)
Depreciation and Amortization	Subdivided into *Facilities Related* and*Information Technology*	Depreciation and Amortization
Rentals	Subdivided into *Facilities Related* and *Information Technology*	Other Information Technology
Maintenance	Subdivided into *Facilities Related* and *Information Technology*	
Data Processing Services	In *Information Technology*	
Other (Facilities-Furniture/Equipment)	Subdivided into *Facilities Related* and *Information Technology*	
Administration	All in *Other Expenses*	
Office Supplies		
Reproduction/Engineering Supplies		
Professional Services		
Contributions		
Other Taxes		
Dues, Memberships, and Subscriptions		
Conventions and Meetings		
Office Services		
Other (Administration)		
Future Business	*B&P/IR&D*	*B&P/IR&D*
Bid and Proposal	*Bid and Proposal*	*(Bid and Proposal)*
Independent Research and Development	*Independent Research and Development*	*(Independent Research and Development)*
Advertising	In *Other Expenses*	
Other Promotions	In *Other Expenses*	

Table H-1. Indirect Cost Structure (continued)

1921-3	Relationship to IDA Structure	IDA Cost Structure
Other Miscellaneous		
Assessments and Transfers	In *Secondary Pool Allocations*	
Employee Awards	In *Other Expenses*	
Corporate Allocations	In *Corporate Office Allocations*	*Corporate Office Allocations*
		Corporate Aircraft
		Other Corporate Office Allocations
Patents and Royalties	In *Other Expenses*	
Other	In *Other Expenses*	
Credits	*All in Secondary Pool Allocations*	*Secondary Pool Allocations* and *Miscellaneous Credits and Adjustments*
Transfers to other divisions		
Cash Discounts		Assessments and Transfers
Other Credits		Transfers to other divisions
		Cash Discounts
		Other Credits
		Other Expenses
		(Environmental)
		All Other to include the following:
		Education
		Employee Advertising
		Recruitment Travel
		Employee Relocation
		Composite Employment
		Other Employment
		Telephone and Telegraph
		Postage
		Travel
		Other Communication/Travel
		Expendable Tools and Equipment
		Freight

Table H-1. Indirect Cost Structure (continued)

1921-3	Relationship to IDA Structure	IDA Cost Structure
		Material Handling
		Manufacturing Supplies/Services
		Product Servicing
		Tool Handling
		Medical Services
		Other Production Related
		Office Supplies
		Reproduction/Engineering Supplies
		Professional Services
		Contributions
		Other Taxes
		Dues, Memberships, and Subscriptions
		Conventions and Meetings
		Office Services
		Other Administration
		Advertising
		Other Promotions
		Employee Awards
		Patents and Royalties
		Other Miscellaneous

APPENDIX I

CCDR COSTS

APPENDIX I

CCDR COSTS

We estimated contractor and government costs associated with administering the CCDR system. However, our estimate established only a minimum level of costs because we did not include all CCDR system activities and related costs. We primarily collected costs for ACAT I programs because they were the focus of this study. The CCDR system also incurs costs for ACAT II, III, and IV programs and for CCDR estimates prepared for RFPs and program cost projections. We did not estimate the costs for this workload. Also, our estimates do not reflect the use of CCDRs by cost-analysts in performing their cost estimating function, which we view as an activity external to the CCDR administration process.

COST DESCRIPTION

Both contractors and DoD incur costs to support the CCDR system. Contractors incur costs to prepare and process the CCDRs. Contract cost represents the total cost required to develop, prepare, and produce the CCDR data (i.e., report types, level of reporting, and frequency) specified in the contract. Development and preparation costs typically include any research, design, drafting, writing, inputting (e.g., typing, keypunching), and reviewing. Production costs usually include materials, printing, handling, inspection, storage, and transmitting (e.g., mailing) the data. Other expenses involved in development and production include computer time, travel, and reproduction expenses. The cost of CCDR data should be estimated as if the data were being priced and negotiated as a separate contract data requirements list (CDRL) item. This price will include direct cost and allocable indirect cost (both overhead to include fringe benefits and G&A).

DoD incurs costs to establish the contractual requirements and to administer (handling, maintaining, reviewing, and using) the CCDR system. These costs can be further broken down into non-recurring (one time) and recurring (ongoing) costs. The principal non-recurring cost for DoD involves the establishment of the data requirement in the CCDR Plan, which includes specifying the WBS, type of reporting, and reporting frequency. The contractors' major non-recurring cost is incorporating the data requirement

into their accounting system. Recurring costs involve report preparation by contractors and subsequent processing and use by DoD.

Estimating contractor and DoD costs for their involvement in the CCDR system proved to be a difficult and imprecise process. For contractors, the majority of individuals working on CCDRs are indirect personnel who also do not account for their time by task. In some cases, contractors propose costs by CCDR (either to add to or delete from a given contract). However, the costs usually lose their identity in the negotiation process because they are included with many other reporting requirements. DoD generally does not account for employee time by specific task. In addition, the typical DoD person who works on CCDRs does so on a part-time basis and also has responsibility for other tasks.

During our survey, we asked government and contractor organizations to estimate the cost of CCDR administration. Some organizations, largely contractors, provided estimated costs. However, the majority of respondents provided only brief, subjective descriptions (e.g., "the costs are not significant"). As a result, in a separate data call, OD(PA&E) asked the Service cost centers to provide estimated contractor and DoD costs to support the CCDR process. We used those responses combined with selective follow-up telephone queries to determine costs. We then used the best estimates provided in the surveys and the responses to the data call to estimate costs. Table I-1 summarizes the contractor data sources.

Table I-1. Sources of Contractor CCDR Costs

Contractor	Cost Data Obtained By Using
GE	Hours provided in survey meeting and a standard IDA developed rate
LASC	Survey meeting and Air Force provided data
Subcontractor	Air Force provided data and survey meeting
Subcontractor	Air Force provided data and survey meeting
LFWC	Air Force provided data
P&W	Air Force provided data
Comanche	
Boeing	Army provided estimate and survey meeting
Sikorsky	Army provided estimate and survey meeting
NAVAIR Contractors	Navy provided data
NAVSEA Contractors	Navy provided data

Data were provided directly to us by four contractors during our survey meetings. We eliminated one contractor's estimate because we considered it to be an outlier (i.e., almost three standard deviations greater than the average or mean cost). In two cases (GE

and LFWD), the contractors provided only man-hours, which we priced out at a fully loaded rate of $67.50 based on our experience with other contractors. The LASC estimate provided by the Air Force included two subcontractors. We used the LASC costs provided directly to us and subtracted that from the total cost provided by the Air Force. We then divided the remaining costs equally between the two subcontractors. The LFWC estimate was used to validate the Air Force-provided estimate. The LFWC estimate was about $6 thousand less than reported by the Air Force, but did not include computer costs. We therefore concluded that the higher, Air Force estimate was reasonable.

The Army provided only one estimate of $65,600 for the Comanche program. Based on our visit to the PO, we knew the Boeing and Sikorsky team prepared separate CCDR reports, which were then added together to form one program CCDR. We simply split the costs evenly between the two contractors. NAVAIR provided estimates based on the estimated man-hours to complete the CCDR report formats as shown at the top of each of the 1921 forms. NAVSEA developed its estimates based on queries to contractors.

For internal DoD costs, we used the data provided by each of the Services and compared the results to the data collected in [23]. Table I-2 summarizes the data sources. The Army provided hours for the Comanche PO and the Air Force provided hours for the F-22 and F-16 Program Offices. The Navy provided actual cost estimates based on NAVAIR and NAVSEA input.

Table I-2. Source of DoD CCDR Costs

Organization	Cost Data Obtained By Using
Army/Hellfire PO	Army-provided hours and IDA rates
NAVAIR Programs	Navy-provided estimate
NAVSEA Programs	Navy-provided estimate
Air Force/F-22 PO	Air Force-provided hours and IDA rates
Air Force/F-16 PO	Air Force-provided hours and IDA rates

COST ESTIMATES

Table I-3 summarizes the cost estimates obtained either directly from the contractors or from the Services who collected the data from the contractors or made their own estimates. Based on our limited sample, the simple average cost for an annual submission of all four CCDR formats was $24.2 thousand.

Table G-3. Annual Contractor CCDR Costs

	1921	1921-1	1921-2	1921-3	Total
GE	1,080	1,080	**1,080**	16,200	19,440
LASC	4975	4,975	4,975	**4,975**	19,900
Subcontractor					32,650
Subcontractor					32,650
LFWC					29,580
P&W	2,000	2,500	2,500	**2,500**	9,500
Comanche					
Boeing					32,800
Sikorsky					32,800
NAVAIR Contractors	675	16,200	338	810	18,023
NAVSEA Contractors					14,500
Average Cost					24,184.3

Note: Numbers in bold represent IDA estimates based on the other data provided for that organization.

The majority of CCDR reports require more frequent reporting, typically semi-annually, except for the 1921-3, which is an annual submission. We assumed semi-annual reporting with less review time required for the second set of reports (75% since there was no 1921-3 report) than annual reporting. We simply took three quarters of $24.2 thousand or $18.2 thousand and added this to the $24.2 thousand annual cost to arrive at an estimated cost of $42.4 thousand. We estimated there were 212 ACAT I contracts by using the data provided in the Annual CCDR Status Reports for the Air Force and the Navy and a telephone response from the Army. The number 212 appeared to be reasonable because the CAIG expert on CCDRs informally estimated there were about 200 ACAT I contracts. We calculated the estimated cost for all ACAT I CCDRs at $8,988,800 (just about $9 million) by multiplying the number of programs by the average cost.

Table I-4 shows the estimated internal DoD costs for administering the CCDR system based on data provided by the Services. The Army provided an hourly estimate for the Hellfire program of 160 hours for an annual submission. We divided the hours into 100 for requirements and 60 for review. We used an estimated hourly rate of $30, which was intended to represent direct costs only. The Navy provided dollar cost estimates for NAVAIR and NAVSEA. We used their estimates for annual submissions. The Air Force provided hourly estimates for the F-22 and F-16 programs and we applied the $30 rate.

The CCDR requirements process is a non-recurring event tied to new contracts. We assumed that 20% of the 212 ACAT I contracts would represent new contracts each year. We took 42 contracts and multiplied it by the average requirements cost of $4,691 to arrive

at an estimated total non-recurring cost of $197,022. We calculated the recurring costs by using the ACAT I total of 212 contracts and the average annual cost based on semi-annual submissions. We used the annual cost of $1,401 and added 75% or $2,451 for the additional reporting cycle, as was done for contractor costs. This resulted in an estimated recurring cost of $519,612 (212 contracts × $2,451). Total internal costs for non-recurring and recurring were $717,000.

Table I-4. Internal DoD CCDR Costs

Organization	Requirements	Processing
Army/Hellfire PO	3,000	1,800
NAVAIR Programs	2,512	1,569
NAVSEA Programs	10,382	1,384
Air Force/F-22 PO	6,360	810
Air Force/F-16 PO	1,200	1,440
Average Cost	4,690.8	1,400.6

We noted the Navy estimates captured almost all costs for those involved in the CCDR system. The Army and Air Force costs reflected only PO effort and did not include any costs incurred for CCDR processing at intermediate commands, major commands, and Service headquarters. Given the responses to our surveys, we did not consider such costs to be significant and assumed they would be reflected in the overhead application.

We used direct labor costs only to compare the results with those obtained by Andrulis Research Corporation in Reference [23], which used activity based costing (ABC). Our objective was to determine if the two estimates were sufficiently reconcilable to provide support that the estimates were reasonable approximations.

The Andrulis study estimated total DoD direct costs to be $301,000. However, the study points out that ABC is considered to be successful if 80% of the costs are assigned to activities. If we assume $301,000 represents 80% of the costs, total direct costs would approximate $376,000. However, costs were not collected at the PO level (except for the Navy where NAVAIR and NAVSEA provide cost analysis support to the POs) and at all cost analysis organizations. Using the PO data (Hellfire, F-22, and F-16) from Table I-4, we calculated average non-recurring and recurring costs at $3,520 and $1,350, respectively. The Army and Air Force combined had 95 ACAT I contracts. This resulted in non-recurring costs of $66,880 (95 × 20% × $3,520) and recurring costs of $128,250. We added these amounts to the $376,000 to get an adjusted cost of approximately $571,000. This total was about 20% less than the IDA-computed total of $717,000. Given the two rough estimating approaches used in each of the studies, we considered the results to be

comparable. As a result, we used our estimate to arrive at total costs, we applied an overhead rate of 125% to the direct base of $716,644 to arrive at a total cost of $1,612,408.

Total CCDR costs are, at least, approximately $10.6 million, consisting of almost $9 million in contractor costs and $1.6 million, in internal DoD costs. We realized that some of the assumptions we made would not be representative of all the data. For example, many ACAT I contracts must be reported less frequently and others more frequently than twice a year. Another example is the 1921-3 report that only has to be prepared once for a given contractor plant regardless of the number of DoD contracts in that plant having CCDR requirements. We preferred to be on the high side for the ACAT I programs to compensate in part for our exclusion of other CCDR costs such as those ACAT II, III, and IV programs. Our objective was to arrive at a rough estimate for the minimum amount of contractor and DoD costs required to administer the system.

REFERENCES

REFERENCES

[1] Quade, E. S. "A History of Cost Effectiveness." Paper P-4557, The RAND Corporation, April 1971.

[2] Smale, G. F. "A Commentary on Defense Management." Industrial College of the Armed Forces, Washington, D.C., 1967.

[3] Hitch, C. J., and R. N. McKean. "Economics of Defense in the Nuclear Age." Report R-346, The RAND Corporation, 1960.

[4] Hough, Paul G. "Birth of a Profession: Four Decades of Military Cost Analysis." Paper P-7539, The RAND Corporation, August 1989.

[5] Hitch, C. J. "Defense Contractor Planning Report (CDPR) Implementation Plans." Memorandum for the Assistant Secretary of the Air Force (Material), 5 January 1963.

[6] DoD Directive 7041.1. "Cost and Economic Information System." Assistant Secretary of Defense (Comptroller), 7 July 1964.

[7] DoD Instruction 7041.2. "Cost Information Reports." Assistant Secretary of Defense (Comptroller), 13 June 1966.

[8] Assistant Secretary of Defense (Comptroller). "Cost Information Reports (CIR) for Aircraft, Missile and Space Systems." DoD pamphlet, 21 April 1966.

[9] Schlesinger, J. R. "Uses and Abuses of Analysis." Report to the Subcommittee of National Security and International Operations of the Committee on Government Operations, United States Senate, 1968.

[10] DoD Instruction 7000.2. "Cost/Schedule Control Systems Criteria." Assistant Secretary of Defense (Comptroller), 22 December 1967.

[11] Baumgartner, Stanley. "Cost/Schedule Controls on Major US Defense Contracts." Program Management Course Study Guide, Class 1982-1, pp. A-1–A-7.

[12] Military Standard 881B. "Work Breakdown Structures for Defense Materiel Items." Air Force Materiel Command, 25 March 1993.

[13] DoD Instruction 7000.9. "Procurement Information Reporting (PIR)." Assistant Secretary of Defense (Installations and Logistics), 30 April, 1970.

[14] DoD Instruction 7000.11. "Contractor Cost Data Reporting." Assistant Secretary of Defense (Comptroller), 5 September 1973.

[15] Naval Material Command, Army Materiel Command, Air Force Logistics Command/Air Force Systems Command Pamphlet. "Contractor Cost Data Reporting." Joint Logistics Commanders, 5 November 1973.

[16] DoD Instruction 7000.8. "Cost Performance Report." 1 April 1970.

[17] DoD Instruction 7000.10. "Contract Cost Performance, Funds Status, and Cost/Schedule Status Reports." Assistant Secretary of Defense (Comptroller), 1974.

[18] DoD Manual 5000.2. "Defense Acquisition Management Documentation and Reports." Under Secretary of Defense for Acquisition, 1 January 1991.

[19] DoD Directive 5000.1. "Defense Acquisition." Deputy Secretary of Defense. 23 February 1991.

[20] DoD Instruction 5000.2. Defense Acquisition Policies and Procedures. Under Secretary of Defense for Acquisition, 23 February 1991.

[21] "Joint DoD/Industry Total Quality Management Team Report for Program Management on the Cost/Schedule Managment Process." Department of Defense/ National Security Industrial Association, May 17, 1991.

[22] Inspector General Department of Defense Report, "Independent Cost Estimating for Major Defense Acquisition Programs." 92-OIG-01, 5 February 1992.

[23] Andrulis Research Corporation Report, "CCDR Final Report." October 22, 1993.

[24] DoD Manual 5000.4. "Cost Analysis Guidance and Procedures." Assistant Secretary of Defense (Program Analysis and Evaluation), December 11, 1992

[25] DoD Directive 5000.4. "OSD Cost Analysis Improvement Group (CAIG)." Assistant Secretary of Defense (Program Analysis and Evaluation), 24 November 1992.

[26] Defense Contract Audit Agency (DCAA) Manual (DCAAM) 7640.1, "DCAA Contract Audit Manual." Volumes 1 of 2, January 1994.

[27] Data Item Description DI-F-6000C. DoD 5010.12-L. "Acquisition Management Systems and Data Requirements Control List (AMSDL)." October 1987.

[28] Data Item Description DI-F-6010A. DoD 5010.12-L. "Acquisition Management Systems and Data Requirements Control List (AMSDL)." October 1987.

[29] Data Item Description DI-F-6004B. DoD 5010.12-L. "Acquisition Management Systems and Data requirements Control List (AMSDL)." October 1987.

[30] Balut, Stephen J. "The 1993 IDA Cost Research Symposium." Document D-1414, Institute for Defense Analyses, August 1993.

[31] Balut, Stephen J. "The 1992 IDA Cost Research Symposium." Document D-1204, Institute for Defense Analyses, August 1992.

[32] Balut, Stephen J., and Kathryn L. Wilson. "The 1991 Cost Research Symposium," Document D-1003, Institute for Defense Analyses, July 1991.

[33] Balut, Stephen J., and Kathryn L. Wilson. "The 1990 IDA Cost Research Symposium," Document D-828, Institute for Defense Analyses, August 1990.

[34] Balut, Stephen J., and Kathryn L. Wilson. "The IDA Cost Research Symposium," Document D-647, Institute for Defense Analyses, August 1989.

[35] Air Force Cost Analysis Resources Reference System (CARRS).

[36] McCullough, James D., and Thomas P. Frazier. "Defense Contractor Indirect Costs: Pratt & Whitney Aircraft Group, UTC, 1971-1984." Paper P-2001, Institute for Defense Analyses, May 1987.

[37] McCullough, James D., and Thomas P. Frazier. "Defense Contractor Indirect Costs: General Electric Aircraft Engine Business Group, 1979-86." Paper P-2032, Institute for Defense Analyses, April 1988.

[38] McCullough, James D., and Thomas P. Frazier. "Defense Contractor Indirect Costs: Missile Systems Group, Hughes Aircraft Company, 1976-86." Paper P-2114, Institute for Defense Analyses, May 1988.

[39] McCullough, Thomas P. Frazier, and James K. Bui. "Defense Contractor Indirect Costs: General Dynamics–Fort Worth Division, 1969-87." Paper P-2244, Institute for Defense Analyses, August 1989.

[40] McCullough, James D., and Thomas P. Frazier. "Defense Contractor Indirect Costs: Grumman Aerospace Corporation, Grumman Corporation, 1973-87." Paper P-2280, Institute for Defense Analyses, August 1989.

[41] McCullough, James D., and Thomas P. Frazier. "Defense Contractor Indirect Costs: McDonnell Aircraft Company, 1969-87." Paper P-2179, Institute for Defense Analyses, August 1989.

[42] McCullough, James D., and Thomas P. Frazier. "Defense Contractor Indirect Costs: Northrop Aircraft Division, Northrop Corporation, 1969-87." Paper P-2190, Institute for Defense Analyses, August 1989.

[43] McCullough, James D., and Thomas P. Frazier. "Defense Contractor Indirect Costs: Radar Systems Group, Hughes Aircraft Company, 1976-87." Paper P-2234, Institute for Defense Analyses, August 1989.

[44] McCullough, James D., and Thomas P. Frazier. "Defense Contractor Indirect Costs: United Technologies Corporation, Pratt & Whitney, 1971-87." Paper P-2158, Institute for Defense Analyses, August 1989.

[45] McCullough, James D., and Thomas P. Frazier. "Defense Contractor Indirect Costs: Ground Systems Division, Defense Systems Group, FMC Corporation, 1981-88." Paper P-2263, Institute for Defense Analyses, October 1989.

[46] Balut, Stephen J., and James D. McCullough. "Trends in a Sample of Defense Aircraft Contractors' Costs." Docment D-764, Institute for Defense Analyses, August 1990.

ABBREVIATIONS

ABBREVIATIONS

ABC	activity-based costing
ABM	activity-based management
ACAT	Acquisition Category
ACO	Administrative Contracting Officer
ACWP	actual cost of work performed
AFCCA	Air Force Cost Analysis Agency
AFMC	Air Force Materiel Command
AMPR	Aeronautical Manufacturers' Planning Report
ASC	Aeronautical Systems Center
ATCOM	Aviation and Troop Command
BCWP	budgeted cost of work performed
BCWS	budgeted cost of work scheduled
BMDO	Ballistic Missile Defense Organization
C/SCSC	Cost/Schedule Control Systems Criteria
C/SSR	Cost/Schedule Status Report
CAIG	Cost Analysis Improvement Group
CARD	Cost Analysis Requirements Document
CARRS	Cost Analysis Resources Reference System
CCA	Component Cost Analysis
CCDR	Contractor Cost Data Reporting
CCP	Component Cost Position
CDRL	contract data requirements list
CEAC	Cost and Economic Analysis Center
CEIS	Cost and Economic Information System
CER	cost-estimating relationship
CFE	contractor-furnished equipment
CFSR	Contract Funds Status Report
CIR	Cost Information Report
CNA	Center for Naval Analyses
COEA	Cost and Operational Effectiveness Analysis
CPR	Cost Performance Report

CWBS	contract work breakdown structure
DAB	Defense Acquisition Board
DAES	Defense Acquisition Executive Summary
DAU	Defense Acquisition University
DCAA	Defense Contract Audit Agency
DCIS	Defense Cost Information Service
DCPR	Defense Contractors' Planning Report
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
DPRO	Defense Plant Representative Office
DSARC	Defense Systems Acquisition Review Council
EAC	estimate at completion
ECP	engineering change proposal
EDI	electronic data interchange
EIS	Economic Information System
EMD	engineering and manufacturing development
FAO	Field Audit Office
FFRDC	Federally Funded Research and Development Centers
FMC	Financial Management Cost Division
FPRA	forward pricing rate agreement
G&A	General and Administrative
GD	General Dynamics
GE	General Electric
GFE	government-furnished equipment
IDA	Institute for Defense Analyses
INFOARCH	Information Architecture
IPT	integrated product team
LASC	Lockheed Aeronautical Systems Company
LFWC	Lockheed Fort Worth Company
MDA	McDonnell Douglas Aerospace-East
MICOM	Missile Command
MMPR	Missile Manufacturers' Planning Report
MOA	memorandum of agreement
MSEMPR	Missile Support Equipment Manufacturers' Planning Report
NAD	Northrop Aircraft Division

NASA	National Aeronautics and Space Administration
NAVAIR	Naval Air Systems Command
NAVSEA	Naval Sea Systems Command
NCA	Naval Center for Cost Analysis
NSIA	National Security Industrial Association
OD(PA&E)	Office of the Director (Program Analysis and Evaluation)
OSD	Office of the Secretary of Defense
P&W	Pratt & Whitney
PCR	Program Cost Report
PDR	preliminary design review
PEO	Program Executive Officer
PERT	Program Evaluation and Review Technique
PIR	Procurement Information Report
PM	program manager
PO	program office
POE	Program Office Estimate
PPBS	Planning, Programming, and Budgeting System
R&D	research and development
RFPs	requests for proposal
SAF/FMC	Air Force Deputy Assistant Secretary, Cost and Economics Office
SAR	Selected Acquisition Report
SDC	Strategic Defense Command
SMC	Space and Missile Center
SPD	systems program directorate
SPO	system program office
SSDC	Space and Strategic Defense Command
USAF	United States Air Force
USD(A&T)	Under Secretary of Defense (Acquisition and Technology)
WBS	work breakdown structure

UNCLASSIFIED

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	September 1994	Final Report, Jan 1993 – Sep 1994

4. TITLE AND SUBTITLE
Assessment of the Contractor Cost Data Reporting (CCDR) System

5. FUNDING NUMBERS
MDA 903 89C 0003
T-Q7-855

6. AUTHOR(S)
Stephen J. Balut, John J. Cloos

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Institute for Defense Analyses
1801 N. Beauregard Street
Alexandria, VA 22311-1772

8. PERFORMING ORGANIZATION REPORT NUMBER
IDA Paper P-2964

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
OASD (PA&E)
Room 2D278, The Pentagon
Washington, D.C. 20301

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12A. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited.

12B. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

The Contractor Cost Data Reporting (CCDR) system is one of several systems for collecting DoD cost data that were established to meet the rising demand for records of actual cost experiences. Such costs form the bases of projections of the costs of future weapon systems. The CCDR system, now more than twenty years old, has regulatory weaknesses and has experienced implementation failures. This IDA study was initiated to determine what improvements could be made in the quality and usefulness of data collected by this system. IDA concluded that defense cost analysts need actual cost data and will get it one way or another, and that, although the quality and usefulness of CCDR data have declined, alternative collection methods would cost more than the existing system. We found that impediments to use of CCDR data were not insurmountable. We offer recommendations for rebuilding confidence in the data, providing ready access to it, and increasing utility and knowledge of and experience with these data.

14. SUBJECT TERMS
Contractor Cost Data Reporting (CCDR), Costs, Cost Analysis, Contractors, Collecting Methods, Data Management, Department of Defense

15. NUMBER OF PAGES
208

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	SAR

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. Z39-18
298-102

UNCLASSIFIED